ESSAYS ON FAMILY DEMOGRAPHY, HOUSEHOLD FINANCE, AND ECONOMICS OF THE FAMILY

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This dissertation examines the intersection of financial resources, family demography and economic wellbeing of American households at transitional periods in the life course. Changes in union formation, the demographic composition of the population, and family structure since the latter part of the twentieth century have challenged existing theories on household formation, individual decision-making, and economic well-being (Bumpass, 1990). With the increase in woman's labor force participation, the rise of cohabitation, pre-marital childbirth, and single-parent households, conventional models used to explain recent trends in marriage market dynamics, intra-household resource allocation, and wealth inequality are continuously tested, challenged, and revamped to keep pace with a society in a current state of demographic and economic flux.

Chapter one focuses on early and young adulthood and the role of consumer and education loan debt in transitioning into coresidential relationships using a sample of youth coming of age at the turn of the twenty-first century and during a period of economic expansion, increased college enrollment and growing socioeconomic divide in marital patterns in the United States. Results suggest total debt amount is associated with cohabitation, increasing the odds of cohabitation over marriage and remaining single for both women and men. First marriage is positively associated with greater educational attainment for this cohort of young adults, but women with education loan debt are more likely to delay marrying and cohabit first.

Chapter two (co-authored with Daniel T. Lichter) addresses the racial wealth gap by exploring the relationship between marriage and marital histories on wealth accumulation of older Black and White

women. Marital and relationship histories are strongly associated with the wealth accumulation process. Women who marry and stay married accumulated levels of wealth that exceeded those of other women with disrupted family lives. The marriage-wealth nexus is sensitive to a women's position in the wealth distribution, and decomposition analyses highlight the non-trivial role of racial disparities in marital histories in accounting for the racial wealth gap.

The third and final chapter uses seven waves of individual-level data from the Health and Retirement Survey from 1998-2008 to analyze whether there is a causal effect of being an informal basic needs or financial caregiver to an aging parent on one's health outcomes (self-assessed health and depression) and health behaviors (exercise and smoking). The results suggest a positive effect on depressive symptoms of basic needs caregiving for unmarried adult children, and that they may be selecting into that role because of their poor health. Manifestations of caregiving in future periods include, basic needs caregiving increasing the probability of smoking for married women and financial caregiving increases depressive symptoms for unmarried men. These findings suggest that the financial costs of caregiving can influence adult children's health outcomes, in particular for those not currently in a marital union.

Bumpass, L. (1990) What's happening to the family? Interactions between demographic and institutional change. *Demography*. 27(4):483-498.

BIOGRAPHICAL SKETCH

Born and raised in Brooklyn, New York, Fenaba attended Duke University in Durham, NC for her undergraduate studies, where she majored in economics. Senior year under the advisement of Dr. William "Sandy" Darity she studied the historical trends of self-employment among minorities in America during the latter part of the twentieth century as an independent research study. Fenaba learned that self-employment rates for native-born African-Americans were relatively similar to Whites, yet African-Americans tended to operate businesses in industries with high failure rates. She also discovered that she wanted to pursue a career in research. It was her senior year and Professor Darity was the first person to ever speak with her about graduate study. Already fixated upon graduation and entering the workforce, she decided to work for a couple of years before returning to school. Her desire to research and study economic and social policy led her back to academia when she applied and was accepted to the 2005 American Economic Association Summer Program at Duke University. This program was designed to encourage underrepresented students to pursue graduate education in the social sciences. Attending the program helped Fenaba assess candidly her preparation for graduate study. She quickly discovered that she could handle the intensity of the program, which was designed to simulate the first year of graduate study, and that she enjoyed researching and learning again.

In the fall of 2006, Fenaba began graduate study at Cornell University in the Department of Policy Analysis and Management. While at Cornell, she has received an interdisciplinary education and has had the opportunity to supplement her economics training with family and social demography and health behaviors research. She studies the impact that financial resources and constraints such as the availability of credit sources, being unbanked, or heavy indebtedness has on family structure, and the inverse impact that family structure has on economic inequality and health disparities in the U.S. Fenaba studies the role of financial indicators, such as being credit constrained or heavily indebted on demographic outcomes; and, how does family structure and changes to family structures over time impact racial wealth inequalities and health disparities. She has served as a Teaching Assistant for several

classes, including Introduction to Statistics, Economics of the Public Sector, and Race and Public Policy, and as a graduate affiliate of the Cornell Population Center, received several grants to fund survey research and attend conferences to present her work.

In 2008 and 2009, Fenaba returned to the AEA Summer Program, now at the University of California-Santa Barbara, as a teaching assistant. Assistant teaching the Fundamentals of Econometrics and Research Seminar courses, she honed her skills in working with underrepresented undergraduates to provide training in the foundations of econometrics and empirical research methods. As an alumnus of the program, she is committed to extending opportunities, helping to carve pathways to the work she so thoroughly enjoys and encouraging consideration of graduate research. She is also currently a mentee of the AEA Pipeline program, which links minority graduate students with senior faculty members across the country to work on collaborative research projects.

For the last two summers Fenaba has been asked to present an overview of family economics and intra-household decision-making at the MathxEconomics program sponsored by the Economic Education Department at the Federal Reserve Bank of New York. The program exposes high school students who excel in mathematics and are from underrepresented backgrounds to economics. She am not only excited and encouraged talking with young adults about higher education and her research interests, she also knows from personal experience that for many, especially those from disadvantaged backgrounds, the idea of graduate study must be implanted, fostered, and encouraged early on. As an African-American woman, Fenaba is all too familiar with the lack of representation within academia having had only one black female professor in her many years in higher education and two black male professors, one of whom encouraged her to continue on for my doctorate. The demographic composition of the professorate does not reflect the composition of those students coming into the academic pipeline. Fenaba would like to participate in making the professorate more representative of those like her. Most recently, Fenaba was inducted in the Cornell Chapter of the Bouchet Honor Society, and is both humbled and ecstatic to join such a prestigious group of scholars as a lifetime member.

Dedicated to my mom, my sister, and all the people who started the journey with me and are no longer with us, but continue to watch over me.

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I would also like to acknowledge my family, aka my cheering section, aka my fan base, whose continuing support and guidance helped to get through the rough patches and enabled me to recognize, appreciate, and celebrate the good times: my mother Valerie, sister Afua, grandmother Rena and late grandfather John, Jackie and Kenneth, Lynn, June, Deborah and Alfred, Kenyatta, Kendall, John, Dwayne, Justin, the newest additions, Kenya, Kingston, and Kameron, and the Affum family.

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TABLE OF CONTENTS

Biographical Sketch……..v

Dedication……...vii

Acknowledgements……viii

Chapter 1. Debt, Cohabitation, and Marital Timing in Young Adulthood……...1

Introduction……..2

Method…….. .17

Results…….22

Discussion……29

References……35

Chapter 2. Marriage, Marital Histories, and Black-White Wealth Differentials among Older Middle-Aged Women……..53

Introduction……..54

Method…….62

Results……..68

Discussion……78

References……82

Chapter 3. Informal Caregiving, Health, and Health Behaviors: The role of time and monetary transfers from adult children to aging parents-Evidence from Longitudinal Data……97

Introduction……98

Method……105

Results…….112

Discussion……..117

Reference…….....119

DEBT, COHABITATION, AND MARITAL TIMING IN YOUNG ADULTHOOD

Abstract

Using data from the 1997 cohort of the National Longitudinal Study of Youth, I examine whether the transition to first union is influenced by a young adult's personal debt holdings, above and beyond their traditional educational and labor market characteristics. I follow approximately 6,700 youth from early adulthood through their late 20s and compare youth who transition from singlehood into their first cohabitation to those who enter directly into marriage, utilizing a discrete-time competing risks hazard model framework. Results suggest total debt amount is associated with transitioning into a cohabitating union, increasing the odds of cohabitation over marriage and remaining single for both women and men. Outstanding credit card debt increases the probability of cohabitation for young men and women, whereas education loan debt decreases the odds of marriage relative to remaining single and marrying for young women. Lastly, holding debt, independent of debt size, appears to be an independent predictor of first union choice in young adulthood for women. Transitioning to first marriage is positively associated with greater educational attainment for this cohort of young adults, but women with education loan debt are more likely to delay marrying and cohabit first.

Key Words: credit card, cohabitation, education loan, marriage, young adulthood

INTRODUCTION

Many scholars believe that both the delay and the decline in the number of young adults transitioning into a marital union can be linked to the increasing difficulty of achieving full economic and financial independence (Furstenberg et. al, 2004; Danziger and Rouse 2007; Sassler and Goldscheider 2004). Problems with entering and staying in the labor market, high housing costs, and the increasing influence of large student loan debts are often highlighted as contributing factors to this delayed and prolonged transition (Settersen and Ray 2010; Arnett 2004). To date, there exists a sizable literature on the relationship between educational attainment, labor market rewards, and marital formation, especially in young adulthood. Numerous studies document the importance of economic wellbeing and financial stability as a predictor of marriage (Sweeney 2002; Sassler and Goldscheider 2004; Xie et al, 2003), yet little attention is paid to how consumption based measures of economic stability and socioeconomic status, specifically debt, shape union formation decisions.

Youth born in the early 1980s came of age during a period of expansive credit markets and increased college attendance, with changes in federal financial aid policy for post-secondary schooling leading to shifts away from grants towards loan aid. Analysis based on data from the Survey of Consumer Finances indicates a 104% increase in average credit card debt holdings between 1992 and 2001 for 18 to 24-year old headed households (Draut and Silva 2004), and a 427% increase in average education loans from 1983 to 2001 (Chiteji 2007). Over the course of the last three decades the union formation processes of young adults have also changed. The median age at first marriage continued its ascent since the late 1960s rising from 22.0 in 1980 to 26.1 by 2010 for American women, and from 24.7 to 28.2 for men, while the share of young adults who married by age thirty also declined (U.S. Census Bureau 2011; Pew Research Center

2011). At the same time, cohabitation rates have increased for young adults. As early as 2002, the majority of young adult women (59%) could expect to cohabit by age twenty-four (Schoen, Landale, and Daniels 2007). These important trends in the financial and relationship landscapes suggest the need to revisit the relationship between economic resources and early union formation.

This study contributes to a vast literature examining the economic determinants of union formation. Understanding the influence of debt on behavior in young adulthood is important not only because it is highly correlated with other economic resources that determine an individual's financial health and because debt behaviors tend to vary over the life course (Drentea 2000), but also acquiring large debt loads has consequences that impact the ability to borrow and save in future periods (Baek and Hong 2004). Carrying a large debt load, for example, can preclude or delay one from accumulating savings and making future financial investments (Athreya 2001; Bryant 1991). These early financial behaviors may have economic consequences that reverberate throughout subsequent stages in the life course (Baek and Hong 2004; Drentea 2000; Mirowsky and Ross 1999). My study also complements recent research that finds wealth holdings to be both a positive and significant predictor of marriage for cohorts of young adults coming of age during the mid-1980s and 90s (Schneider 2011).

Data are from approximately 6,700 men and women from the 1997 cohort of the National Longitudinal Study. I follow them beginning in early adulthood through their late twenties, and compare youth who transition from singlehood into their first cohabitation to those who transition to first marriage using a discrete-time competing risks hazard model framework. I explore whether the transition to first union is associated with a young adult's personal debt holdings, with a focus on two distinct types of credit obligations, unsecured debt (e.g. credit

cards, bank loans) and education loans, above and beyond the traditional educational and labor market characteristics of "good fortune" presumed to be necessary for marital formation (Sassler and Goldscheider 2004). Conceptually cohabitation and marriage are similar in practice but differ extensively in social and legal recognition. Previous research has shown both a direct and indirect link between marriage and cohabitation and the allocation and management of economic and financial resources within the household. This difference in the financial underpinnings of the two union types may contribute to the behaviors young adults exhibit within the relationship, and also impact their decision on transitioning from singlehood into a coresidential union type, similar to educational and labor market attributes.

Gender, Economic Resources, and Marriage Formation and Marital Timing

The importance of economic resources on union formation for men's and women's marital formation and timing decisions is well documented in the literature. Early theories of union formation argued that men who held a comparative advantage in the labor market benefitted in the marriage market from forming unions with women who specialized in household production as both could gain from exchanging goods from their respective markets (Becker 1981). It was men's economic position and labor market returns that dictated marital formation. Studies consistently found that men's educational attainment, often used as a proxy for labor market rewards, was positively associated with marriage (Clarkberg 1999; Oppenheimer et al. 1997; Sassler and Goldscheider 2004; Xie et al. 2003; Goldscheider and Waite, 1988; Goldstein and Kenney 2001), as was their current earnings (Clarkberg 1999, Mare and Winship 1991; Macdonald and Rindfuss 1981; Sweeney 2002), earnings potential (Xie et al. 2003), employment status (Oppenheimer et al. 1997; Sassler and Goldscheider 2004), and work experience (Clarkberg 1999; Oppenheimer et al. 1997). Men enrolled in post-secondary

programs were less likely to transition to marriage early (Hogan 1978), but accumulated schooling and high educational attainment increased the probability of marrying at older ages (Sassler and Goldscheider 2004; Thornton, Axinn, and Teachman 1995).

For women, the relationship between their economic resources and marital patterns has not been as consistent. As female labor market participation increased, women with a comparative advantage in the labor market, e.g. who earned higher wages, were hypothesized to receive little benefit from heterosexual marital unions. Theoretically, Becker (1981) claimed that for women increased labor market rewards would negatively impact their probability of a marriage, as there would be no gains from trade. At the macro level studies have found evidence to suggest a negative relationship between labor market characteristics and marriage prospects, especially for white women (Blau, Kahn, and Waldfogel 2000). But empirical studies using micro-level data found women with greater earnings were not remaining single. The better educated and those with full-time employment prospects were more likely to transition to marriage, though sometimes after a prolonged search (Sassler and Schoen 1999; Qian and Preston 1993; Goldscheider and Waite 1986).

In spite of marital formation theories outlining the role of economic resources in marital formation decisions, existing theoretical frameworks could not explain the rising age at first marriage in the U.S. Oppenheimer (1988) proposed that marital timing decisions were tied to men's economic position, which she defined as the length and difficulty of their career development. Men who struggled in the labor market, such as low-skilled and low-wage earners, would be less likely to successfully transition to marriage. Studies using career stability trajectories as a proxy for economic stability supported Oppenheimer's marital timing model, finding men with stable careers were more likely to marry (Oppenheimer et al. 1997). Low-

skilled men have had an especially difficult time finding and maintaining employment, with both jobs and wages in low-skill sectors remaining stagnant and declining relative to high skilled employment (Juhn, Murphy, and Pierce 1993); they are also the least likely to marry (Cherlin 2004; Gibson-Davis et al. 2005).

Marital timing models also asserted that as women acquired skills similar to men's, their standards for a spouse would become more complementary. Having an advantage in household production would become less valued (contrary to Becker's model), and socioeconomic achievements more desirable. An individual's economic resources mattered not only for the likelihood of transitioning, but also, the timing of transition. In comparison to research based on data from earlier cohorts of young adult adults born in the mid-1970s and earlier, recent evidence suggests that no longer do only men's economic resources matter. Both male and female economic resources are important for marital formation (Qian and Preston 1993; Sweeney 2002). Consequently, women who acquired greater economic resources could subsidize their spousal search, prolonging it in order to find a better match. This might explain the growing socioeconomic divide between those who marry and those who chose to delay or opted not to marry, and account for the rising median age at first marriage for women and men.

In general young adults tend to express similar sentiments with regards to perceptions of readiness for marriage across the social class spectrum (Gerson, 2007; Sassler and Schoen, 1999; Clarkberg, Stolzberg, and Waite, 1995). These include the desire to be financially established and economically stable by securing stable work, some savings, and decreasing their outstanding debt (Cherlin 2009; Manning, Longmore, and Giordano 2007; Smock, Manning, and Porter 2005). Transitions into cohabitation and marriage, however, have not occurred uniformly across the population. College graduates and young adults from high-income households are less likely

to cohabit (Kennedy & Bumpass 2008), more likely to delay fertility and view cohabitation as a precursor to marriage (Sassler and Miller 2010). Young adults with college degrees, from households with more resources such as having older parents and parents with advanced degrees, tend to be more likely to successfully transition to marriage, both from being single to marriage and cohabitation to marriage (McLanahan and Percheski 2008; Schwartz and Mare 2005; McLanahan 2004; Axinn and Thornton 1992). Given that individuals tends to sort in the marriage market based on similar characteristics, such as age, race, and education, coupled with the increasing important of female economic resources, the socio-economic divide of the marriage market may therefore grow even wider (Schwartz & Mare 2005; Qian 1998; Qian & Preston 1993; South 1991).

Cohabitation, Marital Timing, and Economic Resources

Coresiding with a partner in a sexual relationship without a legal marital commitment, or cohabitation, has become the modal relationship form for young adults (Sassler 2010; Amato et al. 2008). Between 1995 and 2002, the percentage of women aged 19 to 24 who were in a cohabiting relationship grew from 30% to 43%, compared with 16% to 19% for 25 to 29 year olds (Kennedy and Bumpass 2008). Oppenheimer (1997) argued that cohabitation became an adaptive state for individuals who were not necessarily substituting it for marriage, but as a consequence of delays due to the uncertainty of the labor market for men and women's desires to pursue and first establish their career. This rise in cohabitation, along with marital delay, and the growing acceptance of same-sex marriage have all contributed to the deinstitutionalization of marriage (Cherlin 2004). Cherlin (2004) argues that the social norms attached to marriage weakened, strengthening the symbolic meaning of marriage. Symbolically, marriage represents a finish line rather than a starting point of young adult life. As a result, it is no longer an institution

entered into early in adulthood, with couples building their adult lives together in a joint household union. Instead, there is a shift away from shared obligations and asset accumulation throughout one's adult life, toward individual financial and personal responsibility.

Similar proxies for economic resources used to predict marital formation and marital timing have also been used to examine transitions into cohabitation. Studies based on data from the 1970s, 1980s, and early 1990s found educational attainment either uncorrelated or negatively associated with transitions into cohabitation for both women and men (Thornton, Axinn, and Teachman 1995; Clarkberg 1999). Labor market earnings and earnings potential were either not significant or positively associated with cohabitation for both men and women (Xie et al. 2003; Clarkberg 1999). These findings suggest that economic underpinnings were different for the formation of a cohabitation compared with a marriage, and impacted not only which individuals would enter a cohabiting union, but also when (Sassler and Goldscheider 2004; Clarkberg 1999). Findings regarding attributes of union formation are summarized in Chart 1. Of note, is that is no study to my knowledge has examined the relationship between women's current employment status and her odds of cohabitation. I will be able to test this relationship in my current analysis.

[Chart 1 about here]

Growth in Credit Card Debt and Education Loan Debt in Young Adulthood

The recent Great Recession increased scholarly interest in understanding the effect of credit markets on individual decision-making. Since the mid-1980s to the Great Recession, Americans experienced almost thirty years of unprecedented availability and access to both unsecured and secured credit markets (Dynan and Kohn 2007; Lyons 2003; Athreya 2001). Many individuals, particularly those with few assets, such as the low-income, minorities, and young, who would have previously been shut out of these markets (Weller 2010; Mann 2009),

obtained credit as companies diversified their risks across households and offered more attractive products to increase their market share (Mann 2009; Watkins 2000). These financial innovations increased the debt of households that may have already had access, as well as increased the population of those able to gain access (Dynan 2009). General attitudes towards holding debt also became more favorable (Chien and Devaney 2001; Drentea 2000; Schor 1999) and average debt holdings increased as households borrowed against the future to finance present consumption (Sun and Xiao 2007; Bird, Hagstrom, and Wild 1999).

Across all households the rise in debt was largely attributable to increases in housing debt. For young adults, however, the increases are in large part due to changes in the markets for credit card and education loan debt. Between 1992 to 2001 average credit card debt holdings of 18 to 24 year olds increased 104%, rising from $1,461 to $2,985, compared to 38% for all households (Draut and Silva 2004). Demographically, there are more young adult aging through the period compared to previous periods, increasing the numbers of individuals with access to credit and available to hold credit (Chiteji 2007; Draut and Silva 2004). And from a life course perspective, young adulthood should be a period during which individuals should be willing to borrow against their future selves if they expect an increase in future earnings. Some scholars point to the slowdown in real wage growth, which has not kept pace with the rate of inflation, as an additional explanation for the rise in debt holdings, especially among this age group. The inability to pay off debt as easily as they thought they could when the money was originally borrowed increases the likelihood of rolling over debt, with compounding interest, into future periods (Draut and Silva 2004).

The population of young adults with education loan debt has increased as more young adults entered college, a 38% increase from 1999-2008 (NCES, 2010), took longer to finish, and

college tuition costs increased (Fitzpatrick and Turner 2007; Bound, Lovenheim, and Turner 2007). Recent estimates suggest that close to 66% of undergraduates received some form of financial aid in 2007-2008 (NCES 2010). Thirty-eight percent of this aid was received in the form of loans, averaging $7,100. Post-secondary schooling would be an unattainable goal for many without receiving some form of financial aid or grant assistance (Fitzpatrick and Turner 2007; Carneiro and Heckman 2002; Keane and Wolpin 2001; Kane 1996). In spite of several funding options available for low-income students (e.g. Pell grants, student loans) and tax incentives programs for those coming from middle to higher income households to assist with paying for college (e.g. tuition tax credits, 529 plans), the majority of financial assistance programs are loan based, having replaced the dominance of grant aid offered throughout the middle to late twentieth century (Fitzpatrick and Turner, 2007). According to the National Center for Education Statistics, thirty-four percent of undergraduates held federal loans in 2007 (averaging $5,000; $3,400 subsidized and $3,200 unsubsidized), compared with twenty-seven percent who received Pell grants ($2,600). The average college graduate left school with approximately $23,000 worth of debt in college loans in 2008; in 1996 the average debt was $17,000 (Hinze-Pifer and Fry 2010). This replacement of grant assistance with financial aid in the form of student loans means more young adults entering their adult years with a significant amount of debt, which can take years to pay down (King and Bannon 2002).

Several scholars have been quick to highlight that in spite of all the tuition assistance, college enrollment is still an expensive undertaking for most individuals. Additional fees such as room and board, books, and health insurance can add up. And both qualitative research and survey data of young college students indicate that a majority relies on credit cards to supplement costs (Lyons 2008; Draut and Silva, 2004). As of 2008, only two percent of

undergraduates had no credit history, half held at least four credit cards (Sallie Mae 2009), and one in four students report using credit cards to finance their education (Draut and Silva 2004). Recent work on the decision to stay enrolled in college also indicates that students rank high financial difficulties related to college costs associated with staying enrolled (Stinebrickner and Stinebrickner, 2008). Consumer debt, coupled with educational loans accumulated while in school, appear to be setting many young adults up for a life in debt with the potential to impact subsequent phases of the life course, such as labor market earnings, homeownership, and potentially family formation, the focus of this study (Minicozzi 2006; Baek and Hong, 2004).[1]

Existing research on debt behavior in young adulthood, both credit card debt and education loans, has focused largely on college students and college graduates. Early research on the impact of early debt acquisition on later life outcomes, such as career choice, focused on specialized markets, such as medical school debt and doctor's choice of field specialty, finding that those finishing with larger debt loads chose fields with a higher earnings potential to a greater degree (Rosenblatt and Andrilla 2005; Colquitt, Zeh, Killian, and Cultrice 1996).[2] Existing empirical studies focus on college graduates of four-year institutions, yet not all young adults attend college and many who do start do not complete. Less than six in ten students who started a 4-year degree in 2001, 57%, completed in six years, and only 27.5% of 2-year students completed their associates within three years (NCES, 2011). Additionally, access and utilization of credit markets is not limited to the post-secondary school attending population. Only 39.6% of 18-24 year olds were enrolled in degree-granting institutions in 2008 (NCES, 2011), leaving a large proportion of the young adult population understudied.

Credit card debt and education loan debt vary significantly in their structural dynamics, which influence their societal perceptions. Although both could be considered investment debts

given the stage in the life course (most young adults do not have enough income to acquire many of the goods they need), they differ in large part regarding how they are perceived in American society. Drentea (2000) refers to education loan debt as normative debt, given its attachment to higher education, and credit card debt as non-normative as the accumulation of credit card debt is associated with negative financial practices and poor fiscal management skills. Additionally, the structure of the two markets is widely different.[3] Access to credit card debt and bank loans are usually based on past employment and household income measures. Credit card debt oftentimes carries large penalties in the form of high interest rates for a consumer who cannot or is unwilling to pay the full balance within a predetermined relatively short allotted period (Baek and Hong 2004). And, credit card debt is also absolvable in the event of financial insolvency (e.g. bankruptcy) in most states under U.S. Federal Chapter 7 Personal Bankruptcy Law. Education loans acquisition, in contrast, is inherently restricted to the post-secondary school attending population with receipt dependent on the source (public versus private, subsidized versus unsubsidized). Federal loans are means-tested, for example, and repayment is relegated until after school completion or school leaving. And unlike credit card debt and other unsecured debts, education loans are deferrable but not absolvable in the event of financial uncertainty or insolvency. Additionally, in the U.S. there exist federal and local policies that can influence individual behavior towards debt, such as the interest payments on education loans (and mortgages) being tax-deductible. Empirical studies find that the American tax structure does influence individual portfolio behavior and incentivize individuals to hold one debt over another (Poterba 2001). In summary, credit card debt was easily accessible during the study period and average holdings are low compared with education loans. There are strong market incentives to pay off credit card debt faster, whereas the incentives to pay off education loan debt quickly are

low for the post-secondary school attending population who has them.

The Current Study

The current study addresses two baseline questions: 1) What is the relationship between debt holdings and first coresidential union choice in young adulthood? and 2) Does the type of debt matter for union choice? Economists believe that young adulthood should be a period during which individuals should access credit markets to income smooth, essentially using debt to establish themselves for the future. It may be difficult to achieve other markers of adulthood without having secured independent financial means or established a record of financial stability. For example, a youth may get a job to pay down high-interest credit debt, but the job interferes with schooling. And if financial aid is not sufficient, individuals may use credit cards to help finance other areas in their life, such as paying bills or rent, or even to help extended family (Draut and Silvia 2004).

Young adults may or may not hold debt.[4] They borrow debt in the current period based on expected future income to meet unaffordable consumption and educational needs in the present period (Shor 1998). The ability to establish one's economic and financial independence and stability is often cited as prerequisite for marriage (Gibson et al. 2005; Smock, Manning, and Porter 2005). Individual debt holdings can serve as a proxy for perceived financial readiness, providing a signal of which market to enter, cohabitation versus marriage, and when. The ability to transition to a union will depend on the relationship between an individual's perceived financial readiness and their debt holdings, along with observable and unobservable characteristics. The debt amount is observable to the researcher, as is whether the youth forms a union. We are not, however, able to observe others' perception of their financial readiness or if the debt holdings have been revealed to potential partners. Financial readiness is a function of

the two debt parameters, credit card debt and education loan debt, a vector of observed education and labor market characteristics, additional characteristics such as family background and demographics, and unobservable factors. If a youth chooses marriage, they have revealed their preferred union, as well as the ranking of relationship choices to be marriage over cohabitation and remaining single. In the current analysis, cohabitation and marriage are modeled as competing risks. An individual not only chooses to enter a union but also jointly decides the type of union entered, cohabitation, marriage, or remaining single. Modeling the choices as separate binary outcomes might misrepresent the relationship given the three states are correlated, interdependent events. The three choices are separate and distinct, but not substitutable events. [5]

How does debt operate in the relationship market for young adults?

Studies indicate that the informal versus formal distinction between cohabitation and marriage deters cohabitors from investing in relationship-specific capital and impacts their behaviors within the union. Research on intra-household resource allocation finds that whereas married couples pool income and manage resources jointly, cohabitors are more likely to have independent money management systems and split resources (Heimdal and Houseknecht 2003; Treas 1999; Brines and Joyner 1999; Winkler 1997). Cohabitors are more likely to maintain separate bank accounts, for example, which have been shown to be negatively associated with relationship quality and commitment to the relationship (Addo and Sassler 2010).

The social and legal distinctions between formal marriage and informal coresidential relationships, cohabitation, can also impact the criteria (e.g. financial and economic support) individuals assign to entering a cohabiting versus marital arrangement (Oppenheimer et al. 2003; Sassler and Goldscheider 2004; Smock, Manning, and Porter 2005). More explicitly, in contrast to the marriage model proposed by Cherlin (2004), in which individuals are economically stable

and financially secure prior to entering a marriage, cohabitation does not share these same social and financial requirements. It can be viewed as an economically attractive living arrangement since couples often benefit from the advantages of a shared living, such as economies of scale, without bearing the legal and social costs of marriage. Interviews with cohabiting individuals and couples in major urban areas find that respondents view the arrangement as more economical than maintaining two separate residences (Sassler 2004), and close to a third of adults cited finances as a main factor in the decision to live together (Taylor 2010; see also Sassler and Miller (2011) for how this varies by social class).

Given these behavioral differences, one can operationalize how debt would impact the allocation of resources within a marriage versus cohabitation and the decision to enter into one versus the other. In a marital union, debt can be considered an individual financial burden that one brings into the union and removes financial resources from the *joint* household. In a cohabiting union, debt remains the responsibility of the individual, decreasing only one partner's resources, assuming cohabitors maintain separate financial systems. Assuming young adults prefer to be financially established prior to a marital union (Cherlin 2004), marriage will more likely if debt holdings are low and cohabitation if debt holdings are high. This is independent of whether the respondent has revealed their debt holdings to potential partners. The directionality of the association remains the same even if it is assumed that debt values are revealed, marriage will be more likely when an individual has found a partner willing to assume their current debt. It is hypothesized that the formation of a union occurs in the presence of non-zero debt holdings if there has been a consensus to share assets for marriage or not share assets for cohabitation (Schmidt 2008).

In addition to the total amount of outstanding debt influencing the relationship transition

choice, there is also reason to believe that the type of debt held by the young adult matters for a youth's attractiveness in the respective relationship market. Credit card debt is most common among young adults, whereas education loan debt tends to comprise the largest share of a young adult's asset portfolio for those who do have it. Outstanding credit card debt is a sign of accessible current financial resources, but is unattractive in the marriage market. A significant credit card debt load may act as a signal of financial unpreparedness and instability, making an individual an unattractive (low quality) mate in the marriage market, but not in the cohabitation market for which financial requirements are lower. Youth holding a lot of credit card debt may fare better in the cohabitation market, for which entry is cheaper, and choose to cohabit instead of marrying. They may also actively seek cohabitation as a means to cost share. Therefore, credit card debt reduces the price of cohabitation indirectly by increasing the price of marriage. It is hypothesized that transitioning to marriage with positive education loans is positively associated with marriage relative to cohabitation and remaining single. The ability to take on credit card debt will decrease transitioning time, (e.g., help defray moving costs, pay rent) and increase the attractiveness of cohabitation relative to remaining single.

Education loans are considered an investment debt on what may be considered an appreciating asset, education. It is representative of future earnings potential and economic stability. Youth holding non-zero education debt are potentially attractive partners in the marriage market given their expected future earnings potential; however, they are also more likely to delay marriage, prioritizing career and financial stability over marriage (Fry 2010). Additionally, the structure of post-secondary enrollment (e.g. dormitory living, delayed or difficulties with full-time employment) may act as an indirect deterrent to union formation in early and young adulthood. Education loan debt indirectly deters cohabitation and marriage in

young adulthood. Education loans (similar to enrollment) allow an individual to prolong their search. Additionally, the structure of post-secondary enrollment (e.g. dormitory living, delayed or difficulties with full-time employment) may act as an indirect deterrent to union formation in early and young adulthood. Education loan debt indirectly deters cohabitation and marriage in young adulthood. In summary, individuals will be more willing to enter marriage, or risk-share, in the presence of education loans where the expected future earnings potential of the debt holders is positive and larger than their current net wealth. Credit card debt, alternatively, may be a signal of present financial independence, but also a marker of current instability and an indicator of future financial stability or success; individuals are less willing to share a negative financial asset.[6] Although this analysis is not modeling an exchange model explicitly, the relationship market chosen may reveal a preference of not only the respondent, but the partner's preferences also.

METHOD

Data

The 1997 cohort of National Longitudinal Study of Youth (NLSY97) is currently an annual study following a representative sample of youth living in the U.S. who were 12 to 16 years old as of December 31, 1996. The original cohort is comprised of two subsamples, the baseline sample and a supplemental oversample of Black and Hispanic youth also born during the same years. After eleven rounds of data collection, 83% of the original youth were interviewed as of the most recently released wave (2009). The NLSY97 extensively questions youth on their labor market experiences, educational, familial, and relationship backgrounds. The survey also ascertains information on wages, income, and educational debt every survey year. Youth are first asked asset and debt-related questions in the survey year after their eighteenth birthday[7], and

upon reaching their twentieth and twenty-fifth birthdays respondents were asked to complete an assets module containing extensive questioning of all financial and non-financial asset holdings, assets values, and outstanding debts. My study follows youth starting in the first survey wave after completing the age twenty assets module through the most recent survey year. The panel nature of the data allows me to follow the youth from one to eight years after the age twenty assessment.

Two sample restrictions were imposed on the data. Any youth missing complete union history and who missed two consecutive interviews during the study period and experienced a union transition were removed. Second, any youth who already transitioned to a first cohabitation or first marriage prior to the age twenty-asset module are not included in the analysis. Imposing this restriction excludes 1,132 women (25.8%) and 614 men (13.3%) from the final analysis.[8] Including youth with previous coresidential experience would increase the difficulty of separating out whether their debt at age twenty is independent from their previous relationship experience. Multiple imputation is applied to maintain maximum sample size for those missing information on independent variables. The final analytic sample follows 3,025 women and 3,744 men, contributing 14,681 and 19,373 person-years to the analysis.

Cohabitation and Marriage

The main dependent variables are union transitions. Young adults can transition from a single state into first cohabitation or first marriage. Cohabitation is defined in the NLSY97 as a sexual relationship in which an individual resides with a person of the opposite sex with a minimum stay of at least one month. Respondents are asked each survey round their current marital status and to provide dates, month and year, of first cohabitation and first marriage.

Debt Measures

For the credit card debt holdings at age twenty, the variable is coded based on responses to the following question: “Do [you/you or your spouse/partner] have any other debts that you CURRENTLY OWE MONEY ON that we have not already talked about? (Examples include store bills, credit cards, loans obtained through a bank or credit union, margin loans through a stockbroker, and other installment loans. Include credit cards only if the respondent carries a balance.)” If the youth responds in the affirmative, they were then asked to provide total or estimated amounts. The median value is assigned to those youth who choose to only enter in a range (i.e., $0-$1000, assigned a value of $500). The outstanding debt values do not include debt from any mortgages or vehicle loans.

Information on educational loans was asked every survey year (by semester) for youth currently enrolled in any type of post-secondary or advanced degree program after high school. The education loan variable is created using a summated yearly figure of all the currently outstanding loans taken out for educational study. Youth are asked to provide values on all outstanding government subsidized loans and private loans. The focus of this study is government and private loans. The education loan debt variable is generated from the question: “Other than assistance you received from relatives and friends, how much did you borrow in government subsidized loans or other types of loans while you attended this school/institution?” and “How much is still owed on (this/these) loan(s)?” Similar to the credit card debt variable, the outstanding education loans value is computed at the time of the age 20 and age 25 assets module, and remains constant over the study period. Due a large concentration of zeros for both debt measures, the variables are logged in all analyses.

Education and Labor Market Characteristics

The youth’s current educational attainment is categorized into less than a high school

degree, high school degree, some college, and bachelors or more. Current enrollment status is disaggregated between two and four-year programs, with unenrolled as the reference group. Including the unenrolled population in addition to the college-goers and the graduates is important as they too are accessing credit markets and making decisions related to relationship formation. Due to small cell size, all young adults who report still being enrolled in K-12 are grouped with the unenrolled and those enrolled in professional degree or post-secondary programs with the four-year group. Labor market controls include a measure of the youth's logged annual earnings. This is a predicted earnings measure estimated from the young adults hourly wage earnings if they worked full-time year round.[9] Covariates used in the estimation equation include age and highest grade completed and their quadratics, a measure of overall aptitude using the results from the asvab[10] test, race, and current health status. The measure was predicted using all available waves of the young adult pre- and post- transition. Predicted earnings are estimated separately for males and females.[11] Additionally, measures of current employment status include indicators for fulltime work, having worked thirty or more weeks and at least 30 hours per week in the previous year. All education and labor market explanatory variables are time varying.

Additional Controls

Additional controls included in the models consist of family background, demographic measures, educational attainment, and labor force attachment characteristics, all factors expected to impact union formation and timing. All these covariates are considered exogenous to the youth's relationship type and timing decision and are time-invariant across the study period. Controls for family background consist of the mother and father's educational attainment as of 1997, whether the youth resided in a rural area at age 12, a variable equal to one if the youth

lived with both biological parents from birth through age fourteen, and an indicator equal to one if the parental respondent reported negative net wealth in the 1997 survey. Given that cohabitation and marital timing has been shown to vary by race and ethnicity, in addition to sex, in young adulthood (Addo 2011; Amato et al. 2008), the sample is categorized into four ethnoracial categories: non-Hispanic white (reference group), non-Hispanic black, Hispanic, and a small, but notable, percentage of individuals identifying as mixed race. All models control for whether the youth currently resides in a rural area, their birth year, age, and age squared. In order to gain a better perspective of the youth's current economic and financial environment, I include an indicator of whether the youth has negative net worth at the start of the study period, a measure for bank account ownership (checking, savings, or money market).

Analysis Plan

To estimate the role of early debt holdings while controlling for the other covariates on transitioning to cohabitation and marriage in early adulthood, hazard function estimates are generated using maximum likelihood (Allison 1984). This modeling technique is preferable in that it allows for both time varying and invariant regressors in the estimation. Individuals are followed for every year they are at risk of transitioning from single status into a union type. For the competing risks (hazard) models, when the decision to cohabit or marry is jointly determined, multinomial logistic regressions are estimated. As the outcome can be one of two events, cohabitation or marriage, the hazard rates estimated here represent the conditional probability that a youth will transition out of singlehood into a coresidential union given the other event has not occurred. Standard errors are clustered at the individual level using the robust method (Huber 1967), which assumes that observations are independent across individuals and not within. The final dataset is arranged in a person-year format, with each young adult contributing an

observation for each survey year they remain single until they transition to their first union, with all observations after transitioning are censored. Additionally, the sample used is concentrated on young adults beginning at age 20 and examines first union decisions. Not only is this important to avoid reverse causation, prior union history influencing current debt levels, but also, it allows us to model the importance of financial health in the relationship market during this transitional phase in the life course. All tables list the odds ratios, the antilog of the estimated coefficients. An odds ratio greater than one indicates an increased probability of transitioning into the union, and a ratio less than one signifies a decreased likelihood. All models are estimated separately for women and men.

[Figure 1 about here]

RESULTS

Descriptive Statistics

Figure 1 plots the unconditional hazard rates of transitioning to cohabitation and marriage by gender over the study period. At every age, both men and women have a greater hazard of cohabiting than marrying and women transition to cohabitation at earlier ages than men and at greater rates across the study period. The hazard of experiencing a first union increases with age, yet the hazard rates for marriage are low and exhibit a slow and steady increase over the study period, until the very end when they peak at age 29 for both women and men. Within the full sample, both men and women transition to first cohabitation to a larger extent than directly to marriage in early adulthood. The majority of the sample remains single over the study period: 52% for women and 62% of the men. Women were nearly twice as likely to transition to cohabitation first (31%) than directly marry (16.9%), compared with 24.9% of men who cohabit and only 13% who marry. These transition rates are not surprising and are in line with current

research that also finds cohabitation to be the modal pathway to coresidential relationships in young adulthood (Sassler 2010).

In general, close to thirty-four percent of the young women hold credit card debt (averaging $2,449), compared with twenty-eight percent of the men, (averaging approximately $2,702) (not shown). Figures 2 and 3 compare the rates of indebtedness and average debt holdings for young women and men by first union status. For both women and men, the average debt holdings are greatest amongst those who do experience of a transition over the study period, and the proportion of women holding credit card debt outnumber men in all three relationship categories. The difference between men and women who directly marry, however, is not statistically different. The rates of credit card indebtedness differ between the non-transitioners, those who remain single, and those who cohabit or marry; yet I find no significant difference in means between cohabitors and those who marry. Female cohabitors hold the most debt on average, $3,290, whereas men who marry differ from their cohabiting male counterparts by just $65. The only significant difference between credit card debt holdings exists between women who remain single, $2,313, and those who transition into a first cohabitation, $3,290.

Where differences do emerge between cohabitors and marrieds are with education loan debt holdings. Not surprisingly, there are more women in the sample attending college at age 20 at the beginning of the study period than men, (19% compared to 11% of the male sample), and therefore women with education loans outnumber men. Close to 34% of women held some kind of government or private loan averaging $12,043, compared with 22% of the men, with average holdings of $12,261. The average amount of outstanding education loans does not differ significantly by sex. Men and women who remain single have the highest average education loan debt, but the differences are not significantly large compared with the cohabitors or married

groups who also have non-zero education loan debt holdings. Last, over ten percent of the women in the sample report holding both credit card and education loan debt, compared with only six percent of the men. A little less than half of the women in the sample report not having either debt, but more than half of the men in the sample report having neither forms of debt, whereas women hold debt at higher rates in every union category. These results support Chiteji's (2007) findings that the majority of young adults do not have outstanding credit card debt, with high debt loads concentrated amongst a minority. The weighted means values for all the remaining explanatory variables by first union status are listed in Appendix A.

[Figures 2 & 3 about here]

Competing Risks Models: The decision to cohabit or directly marry versus remain single

Table 1 presents the multinomial logistic regression models for women, and Table 2 for men. Each table includes three specifications. The set of results presented in the first column, Model A, includes all explanatory variables including the educational and labor market measures.[12] The second model, B, adds in the combined credit card and education loan debt measure, total outstanding debt, and the third specification, Model C, enters in the continuous debt measures separately. Introducing debt into the model as an additional explanatory variable along with the youth's educational attainment and labor market characteristics after the first specification allows us to test whether debt is acting as a mediator or operates independently from the other economic resources previously used as predictors of relationship formation. While debt values can independently signal an individual's financial state, it could also work in tandem with other financial and economic measures to provide an overall assessment of financial health (see Dew and Price (2010) for a similar analysis on current cohabitors). If debt is sending its own independent signal on the relationship market about the respondent, there should be no

significant change the magnitude of the estimates on the other economic resource measures.

The multivariate competing risks model results for the sample of young women are presented in Table 1. In the first specification, Model A, the estimated odds ratios indicate that educational attainment is positively associated with a first union transition, with the more educated women more likely to transition into marriage. The estimates indicate that young women with less than a high school have decreased odds of directly marrying, and that they are also more likely to cohabit than marrying as indicated by the underlined odds ratios. And while the magnitude of the coefficient is positive (indicating an increased likelihood of transitioning), there does not appear to be a significant correlation between cohabitation and women's current education level. These results are consistent with the education results reported for women utilizing other data sources. Women with more education are more likely to marry directly, even among recent cohorts.

Current enrollment in a post-secondary degree program, both two and four-year degree programs deter cohabitation, and four-year college enrollment decreases the probability of marriage. The results indicate that school enrollment is perceived as incompatible with the early union formation. Women who report holding full-time jobs, on the other hand, have an increased probability of cohabitation. Among this recent cohort of young women, positive economic attributes all appear to be associated with transitioning out of singlehood into a first coresidential union. The estimated coefficient on the predicted annual earnings measures, although not significant in this specification, also suggests that women with independent and positive economic gains have a decreased likelihood of direct marriage.

[Table 1 about here]

With the addition of the total debt measure in the second specification, Model B, total

debt holdings increases the odds of transitioning to cohabitation by 2.9% ($p<0.01$). Conversely, the odds ratio on transitioning to marriage is less than one, indicating decreased odds of marriage; however, the relationship is not significant. It is also interesting to note that when the debt measure is added to the model, the magnitude of the coefficients on the other economic resource measures strengthen in magnitude compared to the Model A, indicating total debt holdings has an additive impact on the additional socioeconomic attributes in the relationship market, and for this recent cohort of young women is an independent predictor of union formation. The labor market characteristics indicate that for a 1% increase in annual earnings, a young woman's odds of marriage declines 22% in any given year, whereas fulltime employment is now positively and significant related to transitions into a first cohabitation or direct marriage.

The final results, Model C, assess whether the type of debt held matters for the union decision choice. The competing risks models reveal that relative to remaining single, cohabitation is the preferred relationship choice for women with positive credit card debt. A percentage point increase in credit card debt is associated with a 4.6% increase in the odds of cohabitation. Young women with education loan debt are also more likely to transition to first cohabitation, but have a decreased probability of directly marrying. The results suggest that women with education loan debt are not only less likely to transition to marriage, they are also more likely to either remain single or experience a first cohabitation. Additionally, by delineating by debt type this specification strengthens the positive association between holding an advanced degree and transitioning to one of the union types. Additional runs (not shown) indicate there does not exist a statistically significant interaction effect of debt type and educational attainment. These results highlight that the economic attributes of young women from their educational attainment to their labor market characteristics are associated with their first union choice, with

debt playing an independent role on her transition during young adulthood. The fact that debt influences cohabitation and deters marriage suggest as hypothesized that the financial underpinnings related of the two union types differ for this sample of young women, and that the type of union entered is sensitive to debt type.

The regression results for young men, whose economic attributes have historically mattered more for union formation and marital timing are provided in Table 2. From the first specification, prior to the addition of the debt measures, the competing risks model indicates that marriage is positively and significantly related to being college educated, consistent with prior studies. Men with bachelor's degrees or more are 78% more likely to directly marry than remain single when compared to men with only a high school degree. While previous studies found that current enrollment deters marriage (Sassler and Goldscheider 2004; Axinn and Thornton 1992), for this sample of young men being currently enrolled in a two or four-year degree program only significantly deters cohabitation when contrasted with the unenrolled population; the odds of transitioning to cohabitation are slightly highly if the young man is in a two-year secondary degree program, 31% less likely compared with 53% for the four-year enrollees. Additionally, men enrolled in 4-year degree programs are more likely to transition to marriage over cohabitation as indicated in Table 2 by the underlined odds ratios. Relative to the 2-year college enrollees, the unenrolled are more likely to transition to first cohabitation and the 4-year enrollees are less likely. Although enrollment tends to deter non-marital coresidential relationships, advanced degrees increase the probability of a transition, particularly into marriage. With regards to the labor market characteristics, being employed full-time is only significant for transitioning into cohabitating unions.

[Table 2 about here]

The addition of the combined debt measure to the male competing risk models (Model B) does not significantly alter the relationships of the other measures of economic stability and earnings potential. Similar to the female results, total debt holdings is positively associated with transitioning into cohabitation relative to remaining single. Additionally, the difference between cohabitation and marriage is significantly different at the conventional levels ($p<0.05$), indicating that men with positive debt holdings are more likely to transition into a cohabiting union rather than remaining single or directly marrying. And, the magnitude of the hazards on the educational attainment controls are strengthened for men, with the inclusion of the debt measures indicating the relevance of debt as an independent assessor of union formation decisions for this sample of young men. From simple comparisons between Table 1 and 2, it is interesting to note the noticeable decrease in significant estimates on the predictor economic resource variables. Not only are women's economic attributes a significant predictor of their first coresidential union, but to a greater degree than for this sample of young men.

Moving across Table 2 to the final model, Model C, the odds ratios corresponding to the credit card debt indicate a positive correlation related to transitioning into both union types. The odds ratios corresponding to movements into cohabitation is weakly significant at the 10% significance level. The relationship with education loan debt holdings and transitioning into marriage is negative, but not significant. The overall odds are small and close to zero, indicating no sizeable impact of debt in the relationship market for men. Education loans neither decreased the probability of marriage, nor increased it. For men, the results suggest that debt type does not have any discernable influence in the decision between the union states. Contrary to what was hypothesized and the estimated odds ratios for educational attainment, for example, the financial underpinnings for the two union types when debt is used as a financial indicator do not appear to

differ for men (certainly not at the standard conventional levels of significance).

[Table 3 about here]

The results presented in Tables 1 and 2 suggest that the amount of debt holdings do exert some influence in the relationship markets for this sample of young adults. The final sets of results in Table 3 address the question of whether it is really a question of debt amount or simply having debt, the mark of indebtedness, which operates in the relationship market. The regression estimates highlight that it may be both for women. Young women reporting any non-zero debt holdings have an increased odds of cohabiting, 18.6%, and are more likely to cohabit over remaining single and marrying (Model A). The regression results emphasize the same relationships for women presented in Table 1; holding credit card debt is positively associated with cohabitation, and having education loan debt decreases the odds of marriage relative to remaining single and cohabitation. Interestingly, for the men it appears that the relationship between debt and a first union transition are relegated to debt amount, with no statistically significant relationships between holding any debt or debt type held and their probability of a first transition.

DISCUSSION

Theories on life course consumption and savings behavior posits that early and young adulthood is the period in which individuals would be most likely to borrow heavily relative to their lifetime earnings, amassing a large debt load to be paid down in later life stages (Drentea 2000; Baek and Hong 2004). This consumption smoothing behavior is aided by the existence of credit markets. It is for this reason that access to and acquisition of credit obligations should spike post-adolescence. The ability to establish one's economic and financial independence is often cited as one of the key criteria for a successful transition to adulthood (Furstenberg et al. 2004).

Acquiring borrowed funds from a creditor that is not a parent can provide signals of financial freedom and reinforce feelings of economic liberation. This study assessed the relationship between debt holdings and first coresidential union choice in young adulthood and whether the type of debt held matters.

My findings suggest that debt holdings, an increasingly significant asset in many young adults' asset portfolios, should be considered as a factor in union formation decisions during this stage in the life course. Additionally, this study presents evidence in accordance with existing research that economic resources still matter for relationship formation for this recent cohort of young adults. The fact that debt holding is positively associated with transitioning out of being single suggests that single life in young adulthood may be difficult to afford. Married life, however, is unaffordable as well. Cohabitation presents an alternative to single life, but not necessarily as a substitute for a marital union for these individuals.

These results all lend support to previous research that finds women's economic attributes are increasingly important for marriage formation (Sweeney 2002; Oppenheimer 1997). It also suggests that there exists some economic threshold for cohabitation, one that may differ for young men and women. My findings indicate that early union formation transition type and timing decisions, for marriage in particular, remain associated with measures of educational attainment and positive indicators of current financial health and future economic stability. The findings for women also support the qualitative research showing debt holdings is not a barrier to cohabitation but can be one to marriage (Smock, Manning, and Porter 2005).

That I find such large gender differences suggest the economic burden that debt presents in a marital union is treated differently within the relationship market for men and women. These results are very much in line with Oppenheimer's theory on marital timing (1988). Current trends

in the marriage market reflect labor market fluctuations, which have seen the rewards to high-skilled men increase disproportionately in size to the low-skill sector's wages. Not only are highly educated men more successful in the job market, but they are also successful in the marriage market, as they are the most likely to transition to marriage. The returns for women should not be discounted, however, as transitioning to marriage is also positively associated with greater educational attainment. Yet in this sample of young adults, women are more likely to pay a penalty for their education loan debt, whereas men do not. The accrual of debt from pursuing greater educational attainment may thus have unintended consequences for women, contributing to the delay in their marital timing, and the divergent destinies of those with economic advantages (who can attend college without amassing much debt) and those who utilize credit card debt to cover life expenses (Musick 2002).

The context of marriage in young adulthood has changed, with the decline in union formation not as severe when the contribution of cohabitation is taken into account. Are young adults opting out of marriage, or selecting into cohabitation? These results indicate that debt appears to be selecting women into cohabitation. One possible explanation is that women fear that as a result of the higher costs of entry in the marriage market, their chances of a quality match might not be as great. Women with debt may be considered unattractive or poor quality in the marriage market, but still have some resources (ex. employment, education, access to credit) that can positively contribute to a nonmarital coresidential household. Alternatively, men with debt (credit card debt, mostly) are much more willing to transition to coresidential unions, cohabitation or marriage, than women, indicating that men may continue to dictate the terms of marital formation within this recent cohort of young adults (Sassler and Miller 2011). Given that men can still negotiate the terms of marriage (e.g., it's more normative for them to initiate

engagement), they are willing to accept a working partner, but not one who is a potential financial burden on the household. A women's economic position does appear to be a significant factor in marital formation, and cohabitation appears to substitute as a less-expensive option until they are financially ready for marriage. Alternatively, the accumulation of education loans can also have an unintended consequence of prolonging the marital search and producing better matches for these women. As Oppenheimer (1997) asserted, young adults are not necessarily rushing into marital unions, but instead opting to form what are now culturally accepted unions that offers many of the same benefits to marriage until they are ready and better quality for transitioning into marriage.

As with any study there are limitations. Since I do not perform a cross-cohort trend analysis, I cannot really assert that debt has become increasingly important factor in the marriage market. Second, debt is a stock quantity, meaning that it is measured at a specific point in time. It is difficult to ascertain from the questioning how long it took the young adult to accumulate the debt recorded at the time of the survey and how long it will take them to pay it off. Additionally, aside for my proxy variable for being unbanked, I was not able to test for actual credit access, whether a youth was credit constrained, as it is not explicitly asked until later interviews, so the results presented reflect actions related to credit utilization. Studies from the economics of education literature have found that access to financial aid for post-secondary schooling is not a constraint for enrollment decisions (Carneiro and Heckman 2002; Stinebrickner and Stinebrickner 2008, although recent research suggest that household credit constraints may negatively impact children's college enrollment decisions, see Lovenheim (2011)). Also, while I do not make any strong causal claims regarding my analyses, my findings provide evidence that debt holdings play a non-trivial role in the relationship decisions of young adults, and that debt

has a significant and statistically different influence on first union choice in the market for union formation for this cohort of young adults born between 1980 and 1984. Finally, because the focus is on first unions, this is not a study of non-marriage, but delayed marriage.

Marriage as an institution has gone through significant changes during recent decades (Cherlin 2005). As recent as 2010, 44% of young adults aged 18-29 believed marriage is becoming obsolete (Pew Research Center 2010). The relationship between economic resources, union formation, and marital timing continues to be an area of demographic interest. Ongoing compositional changes in the labor market, educational market, and financial landscape are salient and undoubtedly impact the American household and family. This paper examines one specific structural factor that emerged in the last three decades within the lives of American youth, increasing indebtedness, and the relationship with their early union formation decisions. This study is an effort to understand the implications of debt accumulation in young adults' relationship decisions, as it may have this unintended consequence on early coresidential union decisions. I have presented evidence that debt may have an independent influence on the first coresidential union choice, and argued that these relationships transitions are may be operating through the differences in debt structure of credit card and education loan debt and the financial requirements for what is needed to form first cohabitation versus first marriage. The last wave of data was gathered in 2009, so it is too early to assess the long-term cohabitation and marriage market impacts of the credit contractions, decreases in savings, high rates of unemployment and under-employment a majority of American households have had to endure as a result of the Great Recession. This is, however, the first recession this cohort of youth has had to live through in adulthood. It will be interesting to follow them through the next decade and compare their continued relationship progression now that they have aged into a period of credit contractions

from an expansionary one. My study also suggest the need for additional attention be paid toward the role of debt on family building behaviors, not just marriage and cohabitation, but also fertility decisions, relationship quality, and remaining married or partnered. In order to address these issues, however, we need new and better forms of data capture these transitional periods in the lives of young adults.

REFERENCES

Addo, Fenaba. 2012. Ethnoracial differences in early union experiences among young adult women." *The Review of Black Political Economy*. Forthcoming.

Addo, Fenaba and Sharon Sassler. 2010. Financial arrangements and relationship quality in low-income couples. *Family Relations*. 59: 408-423.

Allison, Paul D. 1984. Event history analysis: Regression for longitudinal event data. Beverly Hills, CA: SAGE.

Amato, Paul R., Nancy S. Landale, Tara C. Havasevich-Brooks, Alan Booth, , David J. Eggebeen, Robert Schoen, and Susan M. McHale. 2008. Precursors of young women's family formation pathways. *Journal of Marriage and Family*. 70: 1271 – 1286.

Arnett, Jeffrey J. 2004. *Emerging Adulthood: The Winding Road from the Late Teens through the Twenties*. New York: Oxford.

Athreya, K. 2001. The growth of unsecured credit: Are we better off?" Federal Reserve Bank of Richmond. *Economic Inquiry*. 87: 11-23.

Axinn, William. G., *and Arland* Thornton. 1992. The influence of parental resources on the timing of the transition to marriage. *Social Science Research.* 21: 261 – 285.

Blau, Francine D., Lawrence Kahn, and Jane Waldfogel. 2000. Understanding young women's

marriage decisions: The role of labor and marriage market conditions. *Industrial and Labor Relations Review*. 53: 624-647.

Baek, Eunyoung and Gong-Soog Hong. 2004. Effect of family life-cycle stages on consumer debts. *The Journal of Family and Economic Issues*. 25: 359- 385.

Becker, Gary. 1981. *A Treatise of the Family*. Cambridge, MA: Harvard University Press.

Bird, Edward J., Paul A. Hagstrom, and Robert Wild. 1999. Credit card debts of the poor: High and rising. *Journal of Policy Analysis and Management*. 18: 125-133.

Bound, John, Michael F. Lovenheim, and Sarah E. Turner. 2007. Understanding the decrease in college completion rates and the increased time to the baccalaureate degree. PSC Research Report No. 07-626, Population Studies Center, University of Michigan.

Brines, Julie and Kara Joyner. 1999. The ties that bind: Principles of cohesion in cohabitation and marriage. *American Sociological Review*. 64: 333-355.

Bumpass, Larry, James A. Sweet, and Andrew Cherlin. 1991. The role of cohabitation in declining rates of marriage. *Journal of Marriage and the Family*. 53: 913-927.

Bryant, William. K. 1990. The Economic Organization of the Household. Cambridge: Cambridge University Press.

Carneiro, Pedro and James Heckman. 2002. The Evidence on Credit Constraints in Post-Secondary Schooling. *The Economic Journal*, 112: 705-734.

Cherlin, Andrew. 2009. *The marriage-go-round: The state of marriage and the family in America today*. New York: Knopf.

Cherlin, Andrew. 2005. American marriage in the early 21st century. *The Future of Children*. 15: 33-55.

Cherlin, Andrew. 2004. The deinstitutionalization of American marriage. *Journal of Marriage*

and Family. 66: 848-861.

Chiteji, Ngina S. 2007. To have to hold. *The Price of Adulthood: The economics of early adulthood.* ed. by S. Danziger & C. Rouse. Russell Sage.

Chien, Yi-wen and Sharon A. Devaney. 2001. The effects of credit attitude and socioeconomic factors on credit card and installment debt. *Journal of Consumer Affairs*. 35: 162-179.

Clarkberg, Marin. 1999. The price of partnering: The role of economic well-being in young adults' first union experiences. *Social Forces*. 77: 945-968.

Clarkberg, Marin, Ross M. Stolzenberg, Linda J. Waite. 1995. Attitudes, values, and entrance into cohabitational versus marital unions. *Social Forces.* 74: 609–634.

Colquitt, Wendy L., Michael C. Zeh, Charles D. Killian, and James M. Cultrice. 1996. Effect of debt on U.S. medical school graduates' preferences for family medicine, general internal medicine, and general pediatrics. *Academic Medicine*. 71: 400-411.

Danziger, Sheldon and Cecilia Rouse, C. eds. 2007. The price of independence: The economics of early adulthood. New York: Russell Sage.

Dew, Jeffrey and Joshua Price. 2010. Beyond employment and income: The association between young adults' finances and marital timing. *Journal of Family and Economic Issues*. 32: 424-436.

Draut, T. & J. Silva. 2004. *Generation Broke: The growth of debt among young Americans.* http://archive.demos.org/pubs/Generation_Broke.pdf

Dwyer, R. E., McCloud, L., & Hodson, R. 2011. Youth debt, mastery, and self-esteem: Class stratified effects of indebtedness on self-concept. *Social Science Research*. 40: 727-741.

Dynan, Karen. 2009. Changing household financial opportunities and economic security. *The Journal of Economic Perspectives*. 23: 49-68.

Dynan, Karen and Donald L. Kohn. 2007. The rise of US Household Indebtedness: Causes and Consequences. FEDS Working Paper No. 2007-37. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1019052

Drentea, Patricia. 2000. Age, debt, and anxiety. *Journal of Health and Social Behavior*. 41: 437-450.

Fitzpatrick, Maria and Sarah E. Turner. 2007. Blurring the boundary: Changes in collegiate participation and the transition to adulthood. *The Price of Adulthood: The economics of early adulthood.* ed. by S. Danziger & C. Rouse. Russell Sage.

Fry, Richard. (2010). The Reversal of the College Marriage Gap. Pew Research Center. http://www.pewsocialtrends.org/files/2010/11/767-college-marriage-gap.pdf

Furstenberg, Frank. F., Jr., *Sheela* Kennedy, *Vonnie C.* McLoyd, Ruben G. Rumbaut, *and Richard A.* Settersten, Jr. 2004. Growing up is harder to do. *Contexts.* 3*:* 33 – 41.

Gibson-Davis, Christina M., Kathryn Edin, and Sara McLanahan, S. 2005. High hopes but even higher expectations: The retreat from marriage among low-income couples. *Journal of Marriage and Family*. 67: 1301–1312.

Gerson, Kathleen. 2007. "What do women and men want?" *The American Prospect*. http://prospect.org/cs/articles?article=what_do_women_and_men_want

Goldscheider, Frances K., and Linda J. Waite. 1986. Sex Differences in the entry to marriage. *American Journal of Sociology*. 92: 91-109.

Goldstein, Joshua R. and Catherine T. Kenney. 2001. Marriage delayed or marriage forgone? New cohort forecasts of first marriage for U.S. women. *American Sociological Review*. 66: 506-519.

Hardy, Dan, Susan Synder, Kathy Boccella. 2007. No-loan plan at Swarthmore-College joins

Harvard, Princeton and others in extending financial aid. The Philadelphia Inquirer. Retrieved from http://docs.newsbank.com/s/ InfoWeb/aggdocs/AWNB/ 11D841EF77841CC8/0D0CB4F0E6B93180?p_multi=PHIB&s_lang=en-US

Haurin, D. R., Hendershott, P.H., & Wachter, S. M. (1997). Borrowing Constraints and the Tenure Choice of Young Households. *Journal of Housing Research*. 8, 137-154.

Heimdal, Kristen R., and Sharon K. Houseknecht. 2003. Cohabiting and married couples' income organization: Approaches in Sweden and the United States. *Journal of Marriage and Family*, 65: 525-538.

Hinze-Pifer R. & Fry, R. 2010. The rise of college student borrowing. Pew Report. http://pewsocialtrends.org/files/2010/11/social-trends-2010-student-borrowing.pdf

Hogan, Dennis P. 1978. The effects of demographic factors, family background, and early job achievement on age at marriage. Demography. 15: 161-75.

Juhn, Chinhui, Kevin M. Murphy, and Brooks Pierce. 1993. Wage Inequality and the rise in returns to skill. *Journal of Political Economy*. 101: 410-442.

Kane, Thomas J. 1996. College cost, borrowing constraints and the timing of college entry. *Eastern Economic Journal*. 22: 181-194.

Keane, Michael P. and Kenneth I. Wolpin. 2001. The effect of parental transfers and borrowing constraints on educational attainment. *International Economic Review*. 42: 1051-1103.

Kennedy, Sheela and Larry Bumpass. 2008. Cohabitation and children's living arrangements: New estimates from the United States. *Demographic Research* 19:1663–92. Available online at http://www.demographic-research.org/volumes/vol19/47

Lichter, Daniel T., Zhenchao Qian, and Leanna M. Mellott. 2006. Marriage or dissolution? Union transitions among poor cohabiting women. *Demography***. 43:** 223–240.

Lyons, Angela. 2008. Risky Credit Card Behavior of College Students. Handbook of consumer finance research. Springer, 185-207.

Lyons, Angela. 2003. How credit access has changed over time for U.S. households. *The Journal of Consumer Affairs*. 37: 231-255.

MacDonald, Maurice and Ronald R. Rindfuss. 1981. Earnings, relative income, and family formation. *Demography*. 18: 123-136.

Mann, Ronald. J. 2009. Patterns of credit card use among low- and moderate-income households. ed. Rebecca M. Blank and Michael S. Barr. *Insufficient Funds*. 257-284.

Manning, Wendy D. and Pamela J. Smock. 2005. Measuring and modeling cohabitation: New perspectives from qualitative data. *Journal of Family Issues*. 67:989-1002.

Manning, Wendy D., Monica A. Longmore, & Peggy C. Giordano. 2007. The changing institution of marriage: Adolescents' expectations to cohabit and marry. *Journal of Marriage and Family*. 69: 559-575.

Manning, Robert. 2000. *Credit card nation*. New York: Basic Books.

Mare, Robert D. and Christopher Winship. 1991. Socioeconomic change the decline of marriage for Blacks and Whites. Edited by C. Jencks & P. Peterson. *The urban underclass.* Washington, D.C.: The Brookings Institute, 175-202.

McLanahan, Sarah. 2004. Diverging Destinies: How children are faring under the second demographic transition. *Demography*. 4: 607-627.

McLanahan, Sarah, and Christine Percheski. 2008. Family structure and the reproduction of inequalities. *Annual Review of Sociology*. 34: 257-276.

Minicozzi, Alexandra. 2005. The short term effect of educational debt on job decisions. *Economics of Education Review*. 24: 417-430.

Mirowsky, John and Catherine E. Ross. 1999. Economic hardship across the Life Course. *American Sociological Review*. 64: 548-569.

Musick, Kelly. 2002. Planned and unplanned childbearing among unmarried women. *Journal of Marriage and Family*. 64: 915–929.

Oppenheimer, Valerie. K. 1988. A theory of marital timing. *American Journal of Sociology*. 94: 563.

Oppenheimer, Valerie. 1997. Women's employment and the gains to marriage: The specialization and trading model of marriage. *Annual Review of Sociology*. 23: 451-453.

Oppenheimer, Valerie. K., Matthijs Kalmijn, and Nelson Lim. 1997. Men's Career development and marriage timing during a period of rising inequality. *Demography*. 34: 311-330.

Pew Research Center. The decline of marriage and rise of new families. November 18, 2010. http://pewsocialtrends.org/files/2010/11/pew-social-trends-2010-families.pdf

Porter, Jane. 2007. Colleges ease access to financial aid: as tuitions rise, private schools are multiplying grants and capping loans to help middle-class families-and ensure they attract their kids. *Business Week*. Retrieved from http://www.businessweek.com/bschools/content/jan2007/bs20070116_169467.htm

Poterba, James. 2001. Taxation and Portfolio Structure: Issues and Implications, in L. Guiso, M. Haliassos, and T. Jappelli, eds., *Household Portfolios*. MIT Press, 103-142.

Qian, Zhenchao. 1998. Changes in assortative mating: the impact of age and education, 1970-1990. *Demography*. 35: 279-292.

Qian, Zhenchao and Samuel H. Preston. 1993. Changes in American marriage, 1972-1987: Availability and forces of attraction by age and education. *American Sociological Review*, 58: 482-495.

Rindfuss, Ronald. 1991. The young adult years: diversity, structural change, and fertility. *Demography*. 28: 493-512.

Rosenblatt, Roger A., and C. Holly A. Andrilla. 2005. The impact of U.S. medical students' debt on their choice of primary care careers: An analysis of data from the 2002 medical school graduation questionnaire. *Academic Medicine*. 80: 815-819.

Sallie Mae. 2009. How Undergraduates students use credit cards: Sallie Mae's national study of usage rates and trends 2009. *static.mgnetwork.com /rtd/pdfs /**2009**0830_iris.pdf*

Sassler, Sharon. 2010. Partnering across the life course: sex, relationships, and mate selection. *Journal of Marriage and Family*. 72: 557-575.

Sassler, Sharon. 2004. The process of entering into cohabiting unions. *Journal of Marriage and Family*. 66: 491-505.

Sassler, Sharon and Frances Goldscheider. 2004. Revisiting Jane Austen's Theory of Marriage Timing: Changes in Union Formation Among American Men in the late 20th Century. *Journal of Family Issues.*25: 139-166.

Sassler, Sharon and Amanda Miller. 2011. Class differences in cohabitation processes. *Family Relations.* 60: 163-177.

Sassler, Sharon and Robert Schoen. 1999. The effect of attitudes and economic activity on marriage. *Journal of Marriage and the Family*. 61: 147-159.

Schwartz, Christine and Robert Mare. 2005. Trends in educational assortative marriage from 1940 to 2003. *Demography*. 42: 621-646.

Schmidt, Lucie. 2008. Risk Preferences and the Timing of Marriage and Childbearing. *Demography*. 45: 439-460

Schoen, Robert, Nancy S. Landale, and Kimberly Daniels. 2007. Family transitions in young adulthood. *Demography.* 44: 807-820.

Schneider, Daniel. 2011. Wealth and the Marital Divide. *American Journal of Sociology,* 117: 627-667.

Schor, Juliet. 1999. *The overspent American: why we want what we don't need.* New York: HarperCollins.

Settersen, Richard & Barbara E. Ray. 2010. Not quite adults: Why 20-somethings are choosing a slower path to adulthood, and why it's good for everyone.

Shim, S., Xiao, J.J., Barber, B., & Lyons, A. 2009. "Pathways to life success: A conceptual model of financial behavior of young-adults." *Journal of Applied Developmental Psychology*. 30: 708-723.

Smock, Pamela J., Wendy D. Manning, and Meredith Porter. 2005. "Everything's there except money": how money shapes decisions to marry among cohabiters." *Journal of Marriage and Family*. 67: 680-696.

South, Scott J. 1991. Sociodemographic differentials in mate selection preferences. *Journal of Marriage and the Family*. 53: 928-940.

Stinebrickner, Ralph and Todd R. Stinebrickner. 2008. The effect of credit constraints on the college drop-out decision: a direct approach using a new panel study. *The American Economic Review*. 98, 2163-2184.

Sun, Jing and Jing Jian Xiao. 2007. Economic and demographic differences in debt delinquent behavior. *Consumer Interest Annual*. 53: 85-93.

Sweeney, Megan M. 2002. Two decades of family change: the shifting economic foundations of marriage. *American Sociological Review*. 67: 132-147.

Taylor, P. 2010. The decline of marriage and rise of new families. Pew Research Center.

Thornton, Arland, William G. Axinn, and Jay Teachman. 1995. The influence of school enrollment and accumulation on cohabitation and marriage in early adulthood. *American Sociological Review*. 60: 762-774.

Treas, Judith. 1993. Money in the bank: Transaction costs and the economic organization of marriage. *American Sociological Review,* 58: 723-734.

Uecker, Jeremy E. and Charles E. Stokes. 2008. Early marriage in the United States. *Journal of Marriage and Family.* 70: 835-846.

US Census 2011. http://www.census.gov/population/www/socdemo/hh-fam.html#history.

Watkins, J.P. 2000. Corporate Power and the Evolution of Consumer Credit. *Journal of Economic Issues*. 34: 909-932.

Weller, C. 2010. Have differences in credit access diminished in an era of market deregulation?" *Review of Social Economy*. 68: 1-34.

White, Michelle. 2007. Bankruptcy Reform and Credit Cards. *Journal of Economic Perspectives*. 21: 175-200.

Winkler, Anne E. 1997. Economic decision-making by cohabitors: findings regarding income pooling. *Applied Economics*. 29: 1079-1090.

Xie, Yu, James M. Raymo, Kimberly Goyette, and Arland Thornton. 2003. Economic potential and entry into marriage and cohabitation. *Demography*. 40: 351-367.

Chart 1. Economic Resources and Transitions to Marriage and Cohabitation: Major Findings from Previous Literature				
	Marriage		Cohabitation	
	Women	Men	Women	Men
Parental Resources	+	+	-	-
Post-Secondary Enrollment	-	+/-	-	-
Educational Attainment	NS/+	+	NS/+/-	NS
Earnings	NS/+	+	NS/+	NS/+
Employment	NS/+/-	+	?	NS/+

Figure 1. Hazard Rates of Transitioning to First Cohabitation and First Marriage, by age

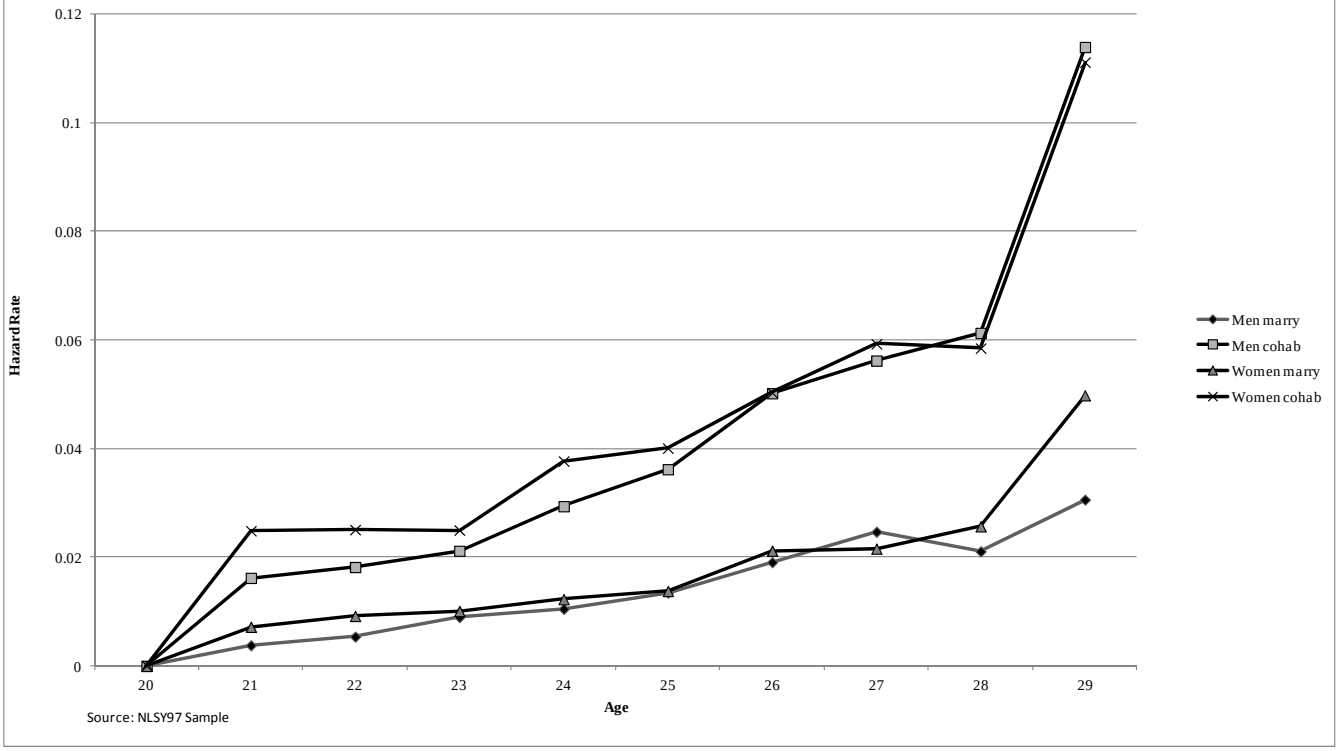
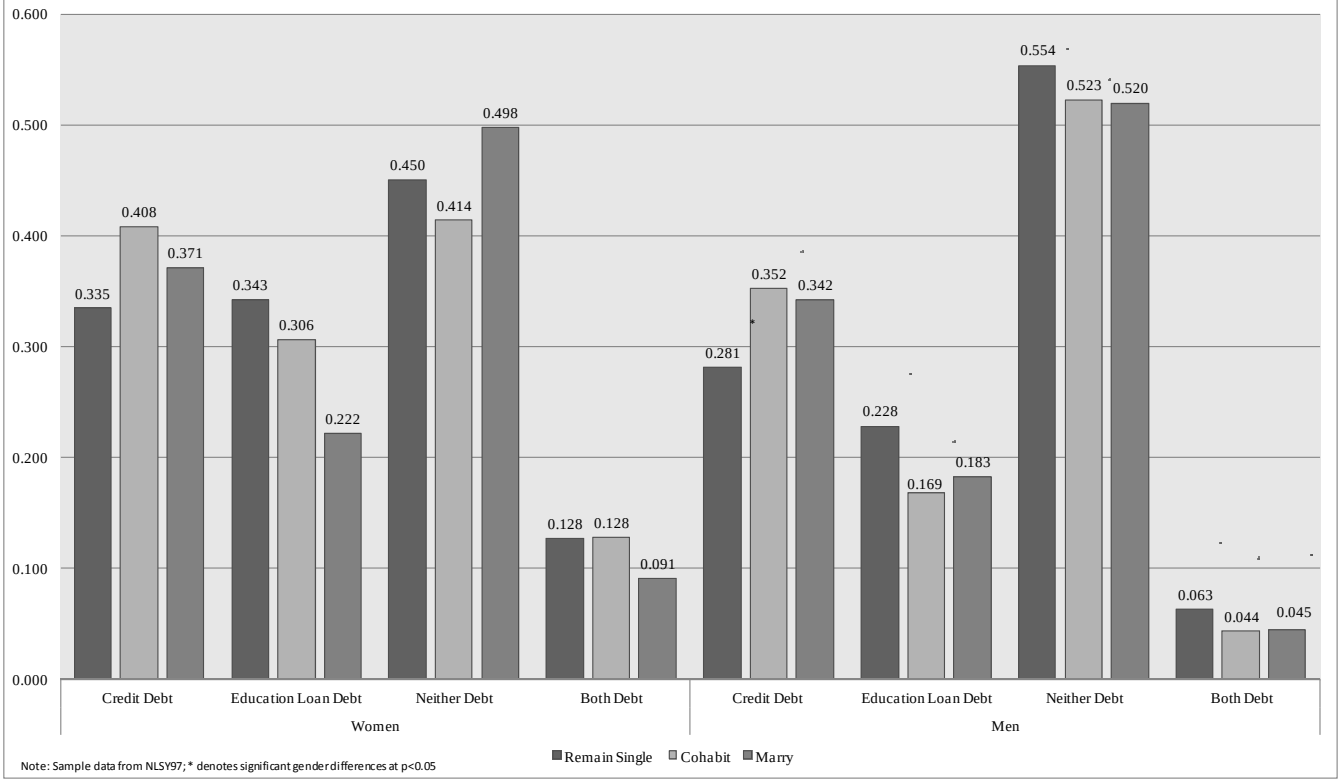
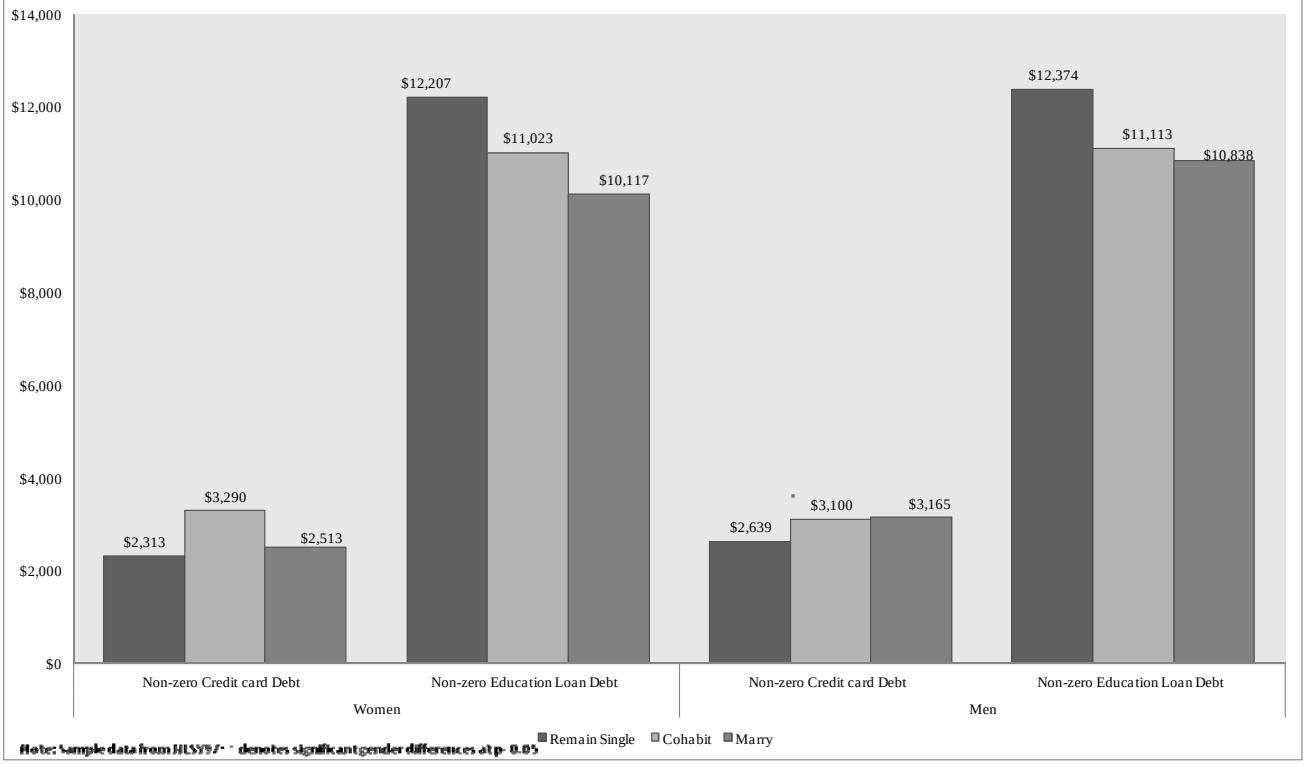


Figure 2. Rates of Indebtedness, by First Union Type



Note: Sample data from NLSY97; * denotes significant gender differences at p<0.05

Figure 3. Amount of Debt Held, by First Union Type



Note: Sample data from NLSY97. * denotes significant gender differences at p<.05

Table 1. Multinomial Logistic Regressions Estimating the Relationship between Debt and Transitioning into Cohabitation versus Marriage relative to Remaining Single for Young Adult Women

	Model A						Model B						Model C					
	Cohabitation versus Remaining Single			Marriage versus Remaining Single			Cohabitation versus Remaining Single			Marriage versus Remaining Single			Cohabitation versus Remaining Single			Marriage versus Remaining Single		
VARIABLES	*OR*		*SE*	*OR*		*SE*	*OR*		*SE*	*OR*		*SE*	*OR*		*SE*	*OR*		*SE*
Educational Attainment(ref: High School)																		
Less than High School	1.181		0.133	0.521	*	0.122	1.205		0.137	0.515	*	0.121	1.191		0.135	0.508	*	0.119
Some College	1.162		0.181	1.876	**	0.377	1.151		0.181	1.884	**	0.379	1.155		0.183	1.913	**	0.386
Bachelors or more	1.197		0.108	1.661	**	0.256	1.188		0.107	1.670	**	0.258	1.215	*	0.110	1.753	**	0.274
Enrollment Status(ref: Unenrolled)																		
Enrolled-2-year Program	0.801	*	0.081	0.758		0.131	0.792	*	0.080	0.761		0.132	0.796	*	0.081	0.772		0.134
Enrolled-4-year Program	0.565	***	0.046	0.574	***	0.078	0.543	***	0.045	0.586	**	0.081	0.563	***	0.048	0.629	**	0.087
esimt																		
Labor Market Characteristics																		
Annual Earnings	1.051		0.135	0.793		0.090	1.072		0.138	0.782	*	0.089	1.077		0.134	0.788		0.089
Full-time Employment	1.400	***	0.097	1.276		0.147	1.389	***	0.097	1.282	*	0.148	1.377	***	0.096	1.261		0.146
Debt Measures																		
Combined Debt Measure							1.029	**	0.009	0.982		0.016						
Credit/bank Debt													1.046	***	0.012	1.009		0.019
Government/Private Education Loan Debt													1.008		0.010	0.950	*	0.017
-2 log likelihood	-6876.877						-6869.238						-6859.109					
Chi2	352.960						363.332						383.890					
df	15.751						15.408						15.350					
Number of Person-Years	14,671						14,671						14,671					
Number of Individuals	3,025						3,025						3,025					

Note: Additional controls include race, ethnicity, maternal and paternal education, rural/urban at age 12, parent's marital status at 14, parent's net worth, current rural/urban area, have a child, age, age squared, birth year dummies, negative net worth at 20, and unbanked at 20;*** p<0.001, ** p<0.01, * p<0.05, + p<0.10; underlines denote statistically significant difference between cohabitation and marriage at p<0.05; italized indicates sig difference at p<0.10 between cohabitation and marriage

Table 2. Multinomial Logistic Regressions Estimating the Relationship between Debt and Transitioning into Cohabitation versus Marriage relative to Remaining Single for Young Adult Men

	Model A					Model B					Model C				
	Cohabitation versus Remaining Single			Marriage versus Remaining Single		Cohabitation versus Remaining Single			Marriage versus Remaining Single		Cohabitation versus Remaining Single			Marriage versus Remaining Single	
VARIABLES	*OR*		*SE*	*OR*	*SE*	*OR*		*SE*	*OR*	*SE*	*OR*		*SE*	*OR*	*SE*
Educational Attainment(ref: High School)															
Less than High School	1.054		0.080	0.633	0.116	1.061		0.081	0.642	0.118	1.055		0.080	0.634	0.116
Some College	1.155		0.172	1.309	0.302	1.149		0.171	1.273	0.293	1.156		0.172	1.305	0.301
Bachelors or more	1.250		0.125	1.780 *	0.279	1.261		0.126	1.727 *	0.268	1.262		0.126	1.779 *	0.280
Enrollment Status(ref: Unenrolled)															
Enrolled-2-year Program	0.694	*	0.073	0.818	0.162	0.682	*	0.072	0.806	0.160	0.684	*	0.072	0.817	0.162
Enrolled-4-year Program	0.474	***	0.045	0.859	0.130	0.466	***	0.043	0.815	0.123	0.470	***	0.045	0.861	0.130
Labor Market Characteristics															
Annual Earnings	1.450		0.331	1.582	0.944	1.469		0.334	1.595	0.952	1.464		0.335	1.568	0.939
Full-time Employment	1.320	**	0.078	1.283	0.142	1.312	**	0.078	1.279	0.142	1.312	**	0.078	1.276	0.142
Debt Measures															
Combined Debt Measure						1.025	*	0.009	0.989	0.016					
Credit/bank Debt											1.022		0.011	1.004	0.020
Government/Private Education Loan Debt											1.015		0.012	0.959	0.021
-2 log likelihood	-8127.966					-8122.412					-8121.086				
Chi2	492.863					503.936					510.126				
df	5.591					5.583					5.546				
Number of Person-Years	19,360					19,360					19,360				
Number of Individuals	3,744					3,744					3,744				

Note: Additional controls include race, ethnicity, maternal and paternal education, rural/urban at age 12, parent's marital status at 14, parent's net worth, current rural/urban area, have a child, age, age squared, birth year dummies, negative net worth at 20, and unbanked at 20;*** p<0.001, ** p<0.01, * p<0.05; underlines denote statistically significant difference between cohabitation and marriage at p<0.05

Table 3. Multinomial Logistic Regressions Estimating the Relationship between Debt Indicator Variables and Transitioning into Cohabitation versus Marriage relative to Remaining Single

	Women								Men							
	Model A				Model B				Model A				Model B			
	Cohabitation versus Remaining Single		Marriage versus Remaining Single		Cohabitation versus Remaining Single		Marriage versus Remaining Single		Cohabitation versus Remaining Single		Marriage versus Remaining Single		Cohabitation versus Remaining Single		Marriage versus Remaining Single	
VARIABLES	*OR*	*SE*	*OR*	*SE*	*OR*	*SE*	*OR*	*SE*	*OR*	*SE*	*OR*	*SE*	*OR*	*SE*	*OR*	*SE*
Educational Attainment(ref: High School)																
Less than High School	1.191	0.135	0.516 *	0.121	1.186	0.134	0.507 *	0.118	1.051	0.080	0.648	0.119	1.062	0.081	0.642	0.118
Some College	1.165	0.182	1.871 **	0.376	1.158	0.182	1.906 **	0.384	1.168	0.174	1.265	0.291	1.147	0.170	1.287	0.297
Bachelors or more	1.211	0.109	1.645 **	0.256	1.220 *	0.111	1.732 **	0.272	1.278	0.128	1.679 *	0.262	1.243	0.125	1.716 *	0.273
Enrollment Status(ref: Unenrolled)																
Enrolled-2-year Program	0.795 *	0.081	0.762	0.132	0.794 *	0.081	0.773	0.134	0.692 *	0.073	0.815	0.161	0.686 *	0.072	0.825	0.164
Enrolled-4-year Program	0.552 ***	0.045	0.587 **	0.081	0.556 ***	0.047	0.627 **	0.087	0.477 ***	0.044	0.830	0.125	0.462 ***	0.044	0.857	0.130
Labor Market Characteristics																
Annual Earnings	1.058	0.139	0.789	0.088	1.057	0.139	0.784 *	0.088	1.453	0.333	1.588	0.944	1.464	0.335	1.574	0.935
Full-time Employment	1.396 ***	0.097	1.280 *	0.148	1.393 ***	0.097	1.266	0.146	1.319 **	0.078	1.282	0.142	1.319 **	0.078	1.283	0.142
Debt Measures																
Holding Any Debt (0/1)	1.186 *	0.090	0.822	0.106					1.066	0.077	0.767	0.099				
Any Credit/bank Debt (0/1)					1.256 *	0.098	0.969	0.131					0.953	0.076	0.799	0.116
Any Government/Private Education Loan Debt (0/1)					1.107	0.096	0.645 *	0.098					1.167	0.117	0.690	0.132
-2 log likelihood	-6871.850				-6865.540				-8124.338				-8121.520			
Chi2	359.360				371.042				499.154				504.886			
df	15.523				15.474				5.568				5.570			
Number of Person-Years	14,671				14,671				19,360				19,360			

Note: Additional controls include race, ethnicity, maternal and paternal education, rural/urban at age 12, parent's marital status at 14, parent's net worth, current rural/urban area, have a child, age, age squared, birth year dummies, negative net worth at 20, and unbanked at 20;*** p<0.001, ** p<0.01, * p<0.05, + p<0.10; underlines denote statistically significant difference between cohabitation and marriage at p<0.05

[1] Consumer advocates are not the only people concerned about the mounting debt households have accumulated over the last three decades. In February 2009, during the midst of the Great Recession, the U.S. Congress passed the Credit Card Accountability Responsibility and Disclosure (CARD) Act to target the perceived predatory practices of credit companies. The new law outlined guidelines specifically aimed at young adults, such as restricting credit access for persons under age 21 and requiring they have cosigners raise credit limits or proof of independent income. There has also been action to reduce the education loan burden in young adulthood. Several private colleges and universities have switched the terms of their financial aid structures to reduce the loan burden of students and their families upon completion and attract competitive students who may choose a less-expensive public university over a more expensive private option (Hardy, Snyder, and Boccella 2007; Porter 2007). There have also been several calls from policy groups, politicians,[1] and young adults for the federal government to forgive outstanding student loan debt given the difficulty millennials have had securing employment since the recession. Many young adults argue they are not getting the expected financial return from their investment or are making enough to pay back the debt burden. Most recently, the current administration announced plans for a student loan debt-relief plan in begin in 2012 amending repayment periods and lowering the threshold for their loan payment as a percentage of one's current income.

[2] All of the descriptive studies on credit card use examined college student behavior with the exception of a 2006 study examining the association between debt and transitioning to parenthood, marriage, and homeownership for 25 to 34 year olds, in which the author finds an inverse relationship between positive debt holdings and transitioning into these adulthood indicators, however, they never reach conventional levels of significance (Chiteji 2006).

[3] In the current analysis, the focus is on non-housing debt for two reasons, homeownership is essentially non-existent given the age group of the sample analyzed and the few homeowners who do exists have either transitioned to the first coresidential relationship or were assisted financially by family and friends to make the purchase.

[4] There are at least two ways in which debt could directly impact union formation through individual decision-making. The first way is if an individual is constrained and cannot access credit to borrow (Cox & Jappelli, 1993). The second way is if the amount of debt held provides signals about an individual's financial wellbeing to the individual and to others, which impacts their perceived readiness for cohabitation versus marriage. The latter is the mechanism tested in this study.

[5] Additionally, qualitative research also has shown that the decision to transition into a coresidential relationship is not a two-step process, with individuals first deciding to form a union and them selecting between cohabitation or marriage (Manning and Smock, 2005).

[6] In the framework outlined above, the relationship decision is continuous in debt size. Is it the debt or debt amount that matters? Schneider (2011) finds support that the symbolic presence of wealth matters for marriage. I argue that the amount and not the mere presence of debt will be more significant for the first union transition choice given how normative it became to acquire and hold debt in recent years.

[7] Youth who are classified in the survey as independent (are married) prior to their 18th birthday are also eligible for the assets section

[8] It also increases the average age of first cohabitation from 20.89 to 22.65 and first marriage from 22.49 to 23.61 for women, and from 21.93 to 23.02 and first marriage from 23.42 to 23.96 for men.

[9] Previous studies argue that using a permanent income measure is incorrect on a young sample, and instead predicted earnings is better given the high volatility of earnings income during this stage of the life course (Haurin, Hendershott, & Wachter,1996; Whittington & Peters, 1996) .

[10] Armed Forces Vocational Aptitude Battery; respondents completed the assessment of arithmetic reasoning, mathematics knowledge, paragraph comprehension, and word knowledge in 1997

[11] Earlier models included job tenure measured in weeks for the most recent job and the cumulative number of weeks spent in the labor force since age 14 as additional measures of economic stability, however, they did not change any of the substantive results so they were removed in the final runs.

[12] In the interest of parsimony, the estimated coefficients for family background and demographic controls are not presented in the tables. The results across all specifications reveal that black women are less likely to transition to either union, Hispanic women have a lower probability of cohabiting, and having a child is positively associated with transitioning into cohabitation first. Maternal education increases the odds of cohabitation, but paternal education decreases the odds of cohabitation for young women. Similar to the female results, black men are also less likely to transition to both unions, and Hispanic men less likely to cohabit. Being raised in a rural area increases the likelihood of direct marriage, and currently residing in a rural area decreases cohabitation. Men who report having a child are also more likely to cohabit and marry than remain single. Men who are potentially credit constrained, report having no bank account, are significantly more likely to transition into cohabitation.

CHAPTER 2: MARRIAGE, MARITAL HISTORY, AND BLACK-WHITE WEALTH DIFFERENTIALS AMONG OLDER WOMEN

Abstract

This study investigates the impact of union history and marital transitions on wealth inequality between older Black and White women (N=7,026). Data from the Health and Retirement Study show large and increasing Black-White differences in wealth. Marital and relationship histories are strongly associated with the wealth accumulation process among older women. Women who marry and stay married accumulated levels of wealth that exceeded those of other women with disrupted family lives. The marriage-wealth nexus is sensitive to a women's position in the wealth distribution. Quantile regression results suggest that racial differences in total wealth holdings between Black and White women exist throughout the total wealth distribution, whereas the relationship between current union history and wealth differentials appears to be significant at the lower tail and middle of the distribution. Decomposition analyses highlight the non-trivial role of racial disparities in marital histories in accounting for the racial wealth gap. As the baby boom enters their retirement years, it will be important to monitor the changing economic circumstances, including their accumulated wealth, of single and minority women.

Keywords: Black women, decomposition, marriage, quantile regression, race, wealth inequality

INTRODUCTION

A recently published study by the Center for Community Economic Development reported that the median wealth of single Black women was $100 in 2007 (Chang, 2010). The study received broad media coverage. For individuals unfamiliar with the history of racial disparities in U.S. wealth, these results might appear shocking and altogether unreal. For scholars familiar with inter-group economic disparities and racial inequality, the report's findings were anything but surprising. Racial wealth gaps in America are large and persistent (Blau & Graham, 1990; Keister & Moller, 2000; Oliver & Shapiro, 2006). Although the low wealth of African Americans received most of the press, it was the adjective *single* that is equally deserving of scholarly attention. Indeed, rising age at first marriage, high rates of marital instability, and increasing non-marriage, especially within the Black community (Ellwood & Jencks, 2004), raise questions about the changing relationship between marital histories and wealth accumulation. Our study sheds new light on the role of changing marital histories in the wealth accumulation process among Black women – and racial disparities in wealth – at older ages.

Our fundamental goal is to balance the current emphasis on income and employment histories in the wealth accumulation process by providing greater sensitivity to the role of widening racial and ethnic differences in family formation (Burstein, 2007). Specifically, we use comprehensive wealth data and retrospective union history data from the Health and Retirement Study (HRS) to evaluate the magnitude and sources of wealth disparities among older women (i.e., aged 51 to 61) born between 1931 and 1953. We have three objectives. First, we document both the level and sources of racial disparities in wealth among older middle-aged women, both married and unmarried. Second, we estimate the association between marital histories and current wealth disparities among older Black women. Specifically, to what extent

do racial differences in marital histories account for racial disparities in wealth? Unlike previous studies, our statistical approach (using quantile regression models) takes into racial disparities across the wealth distribution. Third, as a final heuristic exercise, we decompose black-white differences in wealth into shares due to differences in older women's marital histories and other conventional factors.

Understanding the sources of wealth inequality is perhaps more important than ever during the current period of growing inequality nationally (Neckerman & Torche, 2007; McCall & Percheski, 2010). A recently-released Census report indicated that U.S. income equality is at its highest level since the government first began tracking household income in 1967 (U.S. Census Bureau, 2010). In comparison, wealth inequality has stabilized over the past decade or two, although the concentration of wealth at the top of the income distribution has increased, especially if changes in tax laws (e.g., tax rates on stock yields) are taken into account (Neckerman & Torche, 2007). Today's older women also represent the first full generation of older Americans who were exposed throughout their adult lives to unprecedented changes in American family life – later marriage, high divorce, and growing shares of remarried persons.

THEORECTICAL BACKGROUND

Marriage and Wealth Disparities

Wealth provides a platform for economic opportunity (Gittleman & Wolff, 2004; Oliver & Shapiro 2006). Indeed, racial differences in wealth historically are substantially larger than racial and ethnic differences in income or earnings (Keister & Moller, 2000). Chang (2010) showed that the median wealth of married and cohabiting families was $193,000 in 2007 among Whites, while the comparable figure among Blacks was $47,000. Median household wealth

among single Black women was only $5,000, almost all of which could be attributed to the ownership of motor vehicles.

Previous studies on the White-Black wealth gap have understandably focused on earnings and employment histories, home ownership, saving and investment strategies, and the role of inherited wealth (Blau & Graham, 1990; Oliver & Shapiro, 2006; Shapiro, 2004). Shapiro (2004) and Oliver and Shapiro (2006) found that home ownership and inherited wealth make up the largest share of the average household wealth portfolio. However, despite higher gifted transfers among White households, racial disparities in intergenerational wealth transfers do not explain the large racial differentials in wealth (Gittleman and Wolff 2004).

Other studies of wealth have centered on the working-age rather than retirement-age population, typically estimating the contribution of current or lifetime income or earnings on the Black-White wealth gap (Campbell & Kaufman, 2005; Barsky et al., 2002). Black women clearly are doubly disadvantaged in the labor market; for them, earnings are substantially lower than for either Black men or White women. Black women also spend longer periods of time in the labor market – retirement is often not affordable – while typically working well past the usual retirement age in low-paying jobs (Hogan & Perrucci, 2007). Not surprisingly, they enter older ages at a large economic disadvantage. In 2009, for example, much larger percentages of elderly Black women were poor (21.8%) than their non-Hispanic White counterparts (8.2%) (U.S. Census Bureau 2010a, 2010b).

Accumulated Wealth among Older Women: Racial Disparities

To date, few studies have examined the interplay of gender and racial differences in wealth at older ages. Single women, especially Black and other minority women, account for a growing share of the retirement-age population. The result is that a substantially higher percentage of

elderly women than men are unmarried and living alone; their wealth and economic well-being depend on their past employment and marital histories, as well as the current and past earnings of their husbands. In 2009, 41 percent of all women aged 65 and older were living with spouses. This compares with only 28 percent among African Americans (U.S. Census Bureau, 2010c). Even more striking is that just 18 percent of elderly Black women were widowed, compared with 41 percent of all elderly women. Elderly Black women clearly are much less economically dependent than other women on their living or deceased husbands (i.e., his pension or Social Security income, or the wealth that couples have accumulated over a lifetime; see Tamborini, Iams, & Whitman, 2009). Recent research suggests that Black divorced women who do decide to retire receive significantly less in average retirement incomes than divorced White women (Butrica & Smith, 2012).

To be sure, racial differentials in wealth by age 50 or older may reflect the divergent marital behavior of Black and White women (Burstein, 2007; Ellwood & Jencks, 2004). Compared with their White counterparts, single Black women often face shortages in the supply of “marriageable" Black partners (Hamilton, Darity, & Goldsmith, 2009; Lichter et al., 1992). Black women also are less likely than White women to marry and stay married (Schoen & Standish, 2004; Sweeney & Phillips, 2004). Among cohabitors, Black women are less likely than Whites to transition into marriage; in fact, most Black cohabiting relationships today dissolve rather than segue into marriage, which is a general pattern that characterizes historically-disadvantaged populations (Lichter, Qian, & Mellott, 2006). Remarriage rates also are substantially lower among Black then White women (Sweeney, 1999), which also diminish the lifetime asset accumulation of Black women.

Racial disparities in marriage and family life over the past half-century also have seemingly widened across birth cohorts. Using historical census records, Stevenson and Wolfers (2007) reported that Blacks married at higher rates than Whites during the first half of the twentieth century. Their analyses highlighted a 20-percentage point decline in Black marriage rates between cohorts born in the 1940's and 1950's. By the mid-1950's, the percentage of Whites who had ever married or were currently married exceeded the percentages among Blacks. White marriage rates leveled off, whereas Black marriage rates continued to decline. The "retreat from marriage" among American Blacks mostly reflects changing rates of entry into marriage (i.e., declines in the ever-married population and increases in age at first marriage) rather than rising rates of divorce.

For older middle-aged women, the economic implications of changing marriage and family life are both self-evident and troubling. A large literature documents the negative consequences of divorce and remarriage on women's economic status (Holden & Smock, 1991; Duncan & Hoffman, 1985). Women who experienced divorce during their lifetimes are at a decided economic disadvantage if measured in accumulated retirement wealth (Burkhauser et al., 1991). For example, Schmidt and Sevak (2006) found that unmarried women had fewer assets than both currently married individuals and single men. Single women on average are unable to accumulate the same economic and financial assets that come from stable marriages (Hirschl, Altobelli, & Rank, 2003). Married couples, especially dual-earner households, can save by sharing space and goods (i.e., economies of scale), they can pool income and assets, risk share, and entertain greater flexibility with movements in and out of the labor market (Blau, Ferber, & Winkler, 2002). They also benefit from social and federal policies such as spousal health insurance, pension plans, and social security benefits also are linked to marriage, with widows

being able to collect survivor benefits in the event of a husband's death (Oppenheimer, 2000). Lupton and Smith (2003) found that older households, married couple families in particular, hold twice as much wealth as single-person households. Vespa and Painter (2010) showed that wealth accumulated considerable more rapidly among married women over the life course. Individuals with a history of union instability – as measured by cohabitation with partners other than their husbands – had significantly less wealth than those who married their only cohabiting partner.

Clearly, women's marital histories and wealth accumulation are inextricably linked. But recent studies also suggest that the wealth-accumulating benefits of marriage may be distributed unevenly over the income distribution. Low-income Black women, for example, have less access than White women to men with high earnings potential, an empirical reality that highlights marriage as an important component of the U.S. stratification system. Economically disadvantaged populations are more likely than the middle-class to delay marriage, cohabit, and experience marital disruption and relationship churning (Cherlin, 2009; Lichter, Turner, & Sassler, 2010). For them, marriage is much less likely to be an economic panacea at older ages, if measured by the accumulation of wealth.

Unfortunately, few empirical studies have examined racial differences in marital histories and their implications for wealth accumulation among middle-aged or older women. For example, Holden and Kuo (1996) used data from the first wave of the HRS to examine the relationship between marital histories and net worth for older women (aged 51-to-61 in 1992). They found that couples in first marriages had significantly more assets than currently married couples comprised of partners who had been widowed or divorced before remarrying. Assets were especially low among Black women who were currently divorced or widowed. The net worth of Black divorced women was $68,700, compared with $109,600 among their White

counterparts. For remarried Black women, net worth was slightly higher – $86,400. Yet, for each marital history category, Black women reported fewer net assets than their White counterparts. Holden and Kuo (1996) reported large racial differences in wealth, but did not evaluate how much of the wealth disparity was due to differences in current or past marital behaviors or to other sources.

More recently, Wilmoth and Koso (2002) found that women with erratic union histories had significantly less accumulated wealth than those who remained married. Their empirical analyses included highly refined marital histories that distinguished among never-married women, previous cohabitations, and multiple marriages, while also including many control variables linked to marital history and wealth (e.g., work characteristics, health, and demographic background). Among other results, Wilmoth and Koso (2002) found that women who divorced once or twice accumulated 79 and 88 percent less wealth, respectively, than women in first marriages. Never-married women (who are not currently cohabiting) had 86 percent less wealth. Neither Holden and Kuo (1996) nor Wilmoth and Koso (2002) examined race differences in the wealth accumulation process for women with different marital pathways for women of advanced ages. More recently, Tamborini, Iams, and Whitman (2009) found that changes in Black women's marital patterns, such as a marital disruption, resulted in lower social security receipt.

To summarize, our study bridges two large literatures, one on racial disparities in marital histories and another on racial differences in wealth accumulation. We hypothesize: (1) that racial disparities in wealth are large among older women; (2) that racial differences in union histories contribute significantly to the racial wealth gap. The intersection of race and marriage is revealed in differential poverty at older ages.

The Current Study

Our study makes several specific contributions to our understanding of racial and ethnic disparities in wealth. First, we focus on wealth and asset accumulation among Black women, who arguably have been on the front line of America's family revolution (Ellwood & Jencks, 2004). Second, we evaluate the extent to which racial differences in marital histories have accounted for racial differences in wealth accumulation among older women, ages 51 to 61. Third, unlike previous studies that have been limited to one wave of data from the HRS (Ulker, 2009; Wilmoth & Koso, 2002; Holden & Kuo, 1996) or that have focused on a particular union transition, such as spousal death (Angel, Jimenez, & Angel 2007) or divorce (Zagorsky, 2005; Hoffman & Duncan, 1988), our study exploits the retrospective marital history information across three different cohorts of the HRS. We thus provide up-to-date estimates of racial disparities in women's wealth, as well as evaluate the changing impact of marital histories during a period of racial divergence in marriage and family structure.

Wealth at older ages is shaped by marital history, but it is also affected by several additional key demographic, labor force, and health history characteristics. Wealth accumulation should be positively correlated with age, educational attainment, household income, and past and current labor market attachment and stability (Hirschl et al. 2003; Keister & Moller, 2002). Healthier individuals with little to no history of disease and chronic conditions should also fare better than their unhealthier counterparts (Deaton, 2002), as would religious practices which not only influence family formation processes, but also wealth accumulation practices also (Keister, 2003). Additionally, geographic variation in homeownership and housing values should also differentially impact the wealth accumulation of older women, especially among Black women who are overrepresented in the South and in central cities (Woldoff & Ovadia, 2008; Allen,

2002). And, lastly, familial obligations and household size should also influence wealth accumulation and savings behavior, in particular, the number of dependents the women ever had (Chiteji & Hamilton, 2002). Our analyses include indicators of each of these potential confounders, along with several alternative measures of marital history.

METHOD

Data

The data come from the Health and Retirement Study (HRS), a nationally representative survey of older Americans. The study includes information on family structure, physical and mental health, income, employment status, and job history. The original HRS consists of 51-to-61 year old Americans, with an oversample of African and Mexican Americans, who were interviewed in 1992 and followed biannually thereafter. Approximately 12,500 individuals are drawn from about 7,600 households, representing a response rate of 82 percent. If the original respondent was married at the time of first interview, the spouse was also interviewed and then re-interviewed in subsequent waves. To reduce biases associated with sample attrition, the HRS added two additional cohorts in 1998, which they labeled the Children of the Depression (CODA) and War Babies (WB). Another cohort, the Early Baby Boomers (EBB), was added to the HRS sample in 2004.

Measurement

The HRS wealth and asset data have been shown to be comparable to data from other nationally representative US datasets, such as the Panel Study of Income Dynamics and the Surveys of Consumer Finance (Smith, 1995). For our analysis, we used the wealth variables recently created by the RAND Corporation (Clair, 2010), which use bracket unfolding and imputation coding methods to reduce the incidence of non-response on wealth and income

questions. We created our analytical sample by pooling three cross-sections of Black and White women from the original HRS sample interviewed in 1992, who were born between 1931-1941, the WB cohort interviewed in 1998, born between 1942-1947, and the EBB interviewed in 2004, born 1948-1953. Respondents in each cohort were aged 51-to-61 at baseline, spanned three consecutive cohorts from the mid-twentieth century, and born across twenty-two years. The final sample totals 1,473 Black and 5,553 White women, or 7,026 women in total.

Wealth. For our analysis we use a continuous measure of total household net wealth. The variable is a summated measure of six asset categories consisting of the net dollar value of the primary residence (house value minus all outstanding mortgages), stock portfolios, checking and savings (i.e., mutual funds, investment trusts, checking or savings accounts, CDs or savings bonds, bonds or bond funds), net values of any vehicles, other savings, minus any outstanding debt. All financial values, both income and wealth, have been adjusted to 2008 dollars. Differential access and utilization of the home ownership market by women and Blacks (Sykes 2005) has also contributed to large disparities in homeownership between Black and White households (see Hirschl & Rank (2010) for an overview). We run all models on our net worth value with and without housing wealth and report the results for both.

In preliminary analyses, wealth was estimated by allocating only fifty percent of couple wealth to the woman, which follows the practice of previous studies (Wilmoth & Koso, 2002). Arbitrarily assigning equal proportions of wealth to married women, however, seems incongruent with research on household bargaining models of resource allocation showing that women's relative bargaining power affects how and on whom monies are spent (Lundberg & Pollak, 1996). Most married men also pre-decease their wives, which means allocating fifty

percent of household wealth may seriously misrepresent most women's wealth in the longer run. The per capita results are not provided here, but are available upon request from the authors.

Marital History. We present four models ranging from a basic union history model based on the respondent's current union status to a complex model that incorporates past marital histories similar in style to Wilmoth and Koso (2002). Our first model, the simplest, is based on the current union, whether respondents are currently married or unmarried. Next, we break down the currently unmarried women into previously married and the never married women, given the significant over-representation of Black women in the never married category compared with White women. We then estimate a model that delineates whether previously married women are separated, divorced, widowed, or partnered/cohabiting. For the final model, we divide the currently married women into the continuously married and the remarrieds, either after divorce or widowhood, and separate the partnered sample into two groups, i.e., never married and previously married. During the baseline interview for the HRS cohort, the currently partnered with prior unions were not asked how these former unions dissolved, so we are unable to determine whether they are previously divorced, widowed, or separated.

In addition to these models, we include two additional marital history variables: age at first marriage and the total number of years spent in the longest marital union (including current marriage). In order to construct the latter, we calculate the age at first marriage for all women using the retrospective marital history questions on the starting and ending dates of each marriage. For women who experienced only one union, years of marriage is measured by subtracting age at marriage from age of divorce, death, or survey date.

Controls. Additional control variables include demographic, labor force, and health history characteristics. Women's current age is measured in years. We include an indicator for

whether the respondent is foreign born and currently resides in the U.S. census-defined South. Religious indicators were included as additional controls; respondents could self-identify as Protestant, Catholic, or another religion or are a non-practitioner. Also present in the model are number of children ever born and completed years of education.

In order to capture labor market effects on wealth outcomes, we use total household income in 2008 dollars to estimate a predicted measure of permanent income. The household income is measured as the sum of all salaried earnings, household capital income, pension or annuity payments, social security benefits, unemployment or workers compensation, any kind of government transfers, and any additional household income received, such as alimony or inheritance payments. Because a single annual report of household earnings is a poor estimate of lifetime earnings we create a measure of permanent income composed of the predicted values from a regression of the household's current earnings on several demographic and socioeconomic background variables including age, education, health, number of children, birth cohort, migration status and corresponding spousal characteristics for those currently married (see Blau & Graham, 1990; Menchik & Jianakoplos, 1997). The residuals from the permanent income estimation equations are also included along with a quadratic term as representative of the household's transitory (current) income. We also identify whether respondents are currently employed (omitted category), self-employed, unemployed, out of the labor force, disabled, and retired. Work histories are measured from self-reports of total years spent in the labor market.

We include two measures of overall health and well-being, which acknowledge a large literature suggesting that married individuals tend to be healthier (Waite and Gallagher, 2000). The first measure is a self-assessment of health (SAH), which has been shown to be a stronger predictor of future mortality (Idler and Benjamini, 1997). A second health indicator sums the

number of physician-diagnosed chronic health conditions. Chronic conditions include high blood pressure, diabetes, cancer, lung disease, heart disease, stroke, arthritis, and psychiatric or mental disease. For households in which both members of the household were interviewed (i.e., married couples at baseline), one spouse was selected to be the financial respondent and the other was the familial respondent. For a few married couples, one spouse provided both financial and family information. We also include an indicator variable for whether the woman was the designated financial respondent in the household for the survey. Lastly, we include controls for birth cohort, which identifies the original HRS cohort (the omitted category), the War Babies (WB), and the Early Baby Boomers (EBB).

Analytic Approach

We examine the association between union history and current wealth levels using multivariate regressions. Wealth distributions tend to be highly skewed as a result of extreme outliers and a large concentration of zero and negative values. To reduce the influence of extreme outliers, our models are estimated on a trimmed sample that removes the top and bottom one percent of the distribution. By imposing this restriction we lose 18 Blacks and 126 White women. In addition to OLS, we also present results from quantile regressions. Quantile regressions allow us to compare the conditional mean estimates from the standard least squares regressions to those estimates at the 25^{th}, 50^{th}, and 75^{th} percentiles. We believe that by presenting quantile regression results in addition to OLS, we will show that the wealth returns to marriage and marital history may vary not only by union type, but also at various points along the distribution (see Koenker and Hallock (2001)).

Additionally, we employ a standard mean regression linear decomposition analysis (based on the OLS regression models) to estimate the contribution of racial differences in marital

history to the existing wealth gap. Apart from a study by Altonji and Doreszelski (2005), which accounted for changes in marital history and childbearing over time, no previous study to our knowledge has evaluated the contribution of marital history to the racial wealth gap. The racial wealth gap is computed here by taking the difference between two regression equations for each race, $\widehat{W}^W - \widehat{W}^B$, where $\widehat{W}^W = (X^w\beta^W)$ and $\widehat{W}^B = (X^B\beta^B)$ and w=White and b=Black. So, $\widehat{W}^W - \widehat{W}^B = (X^w\beta^W) - (X^B\beta^B)$. This equation can be rearranged with simple algebra to $(\bar{X}^w\text{-}\bar{X}^B)\beta^W + \bar{X}^B(\beta^W - \beta^B)$ if the White coefficients are used as weights or $(\bar{X}^w\text{-}\bar{X}^B)\beta^B + \bar{X}^W(\beta^W - \beta^B)$ when the Black coefficients are used as the standard. By employing this methodology, the racial wealth gap can be decomposed into two components, the explained portion, or the portion of the racial wealth gap attributable to group differences in the composition of observable characteristics, $(\bar{X}^w\text{-}\bar{X}^B)\beta^W$ or $(\bar{X}^w\text{-}\bar{X}^B)\beta^B$ such as marital history, and an unexplained part, $\bar{X}^B(\beta^W - \beta^B)$ or $\bar{X}^W(\beta^W - \beta^B)$.

By convention, the unexplained portion reflects unmeasured compositional variables (differences in the coefficients), including discrimination. Using this approach, we can also answer the counterfactual question, "How would the wealth gap change had the relationship between the demographic characteristics and the wealth levels of black women been the same as white women, and vice versa?" Given the large racial differences in socio-demographic characteristics, two sets of results are presented from the decomposition analyses, one using black coefficients as the standard, and another using white coefficients (Altonji & Doraszelski, 2005; Blau & Graham, 1990). The different approaches to weighting provide upper (white coefficients) and lower (black coefficients) bounds of total explained racial gap in wealth. By employing this decomposition technique, we can assess the individual contributions of the observables characteristics to the explained wealth gap.

RESULTS

Descriptive Statistics

Table 1 presents our marital history variables and additional covariates for the full sample by race. Our basic union model, Model 1, indicates that 68% of our total sample report being currently married. Of the unmarried, 28% have a previous union history and 4% never married, as shown in Model 2. We delineate the previously married women into four categories, separated (2.5%), divorced (16%), widowed (7.1%), partnered or cohabiting (2.6%). Model 3 indicates that only 37% of black women are currently married compared with 72% of white women (Table 1). Of the previously married, statistically significant differences exist between black and white women who are separated, 9% vs. 1.6%, divorced (2.5% vs. 14.7%), and widowed (14.2% vs. 6.1%). Black women are also overrepresented in the never married category (11.5%) compared with White women (3.2%). Among the currently married (see Model 4), 51% are continuously married with no prior union history, 14% remarried after divorce, and nearly 2% married again as widows. To further delineate different marital histories, we separate the partnered sample into those partnered and never married (0.4%) and partnered, but previously married (2.3%). Our final two marital history measures, age at first marriage and years in longest marriage, reveal significantly different associations for Blacks and Whites. White women married one year earlier on average than Blacks and spent seven more years in marriage, on average.

(Table 1 about here)

The average age of women in the sample is 54 years. Five percent of the sample is foreign born and Southern residents represent 36% of our total sample, and 57% and 33% of Blacks and Whites, respectively. Women averaged 2.7 children; Black women average slightly over 3.1 and the White women closer to 2.6. And lastly, over three quarters of the sampled

women have high school degrees or less. Average household permanent income was approximately $85,000 annually at baseline. Black female households earned on average a little more than half the amount of their White counterparts, with the difference being statistically significant at the .05 level. Close to two-thirds of the sample report being Protestant, a quarter Catholic, and ten percent identify with some other religious affiliation. Black women are almost all Protestant (90%) compared with 62% of White women in the sample.

For the first measure of health status, self-assessment of health, (SAH), Black women reported slightly better health than Whites in the HRS. The second health indicator sums the number of physician-diagnosed chronic health conditions. Scores range from 0-to-8, with a mean of 1.1, indicating a relatively healthy sample. Black women, however, report more chronic conditions than Whites, a difference that is statistically significant at the .05 level. Almost 80% of the Black women were the financial respondent for the survey. This reflects the high percentages of unmarried individuals in the Black sample, compared with the 55% of White women who were financial respondents. And lastly, while the original HRS cohort represents over 40 percent of the total sample, the two recent cohorts, WB and EBB, contribute approximately thirty percent each to the final sample. We find significant differences in representation by race for the HRS cohort, with a greater proportion of White women, and the WB cohort, which contains a higher representation of Black women.

Our first objective is to document the large racial disparities in wealth among older women. Table 2 presents the total net wealth, non-housing net wealth, and portfolio dollar values for our total sample, and then by race. The wealth values reported in Panel A clearly indicate large racial disparities. The mean (and median) values of net wealth holdings by race are significantly different, with over a $200,000 mean difference ($150,000 for the median) in

net wealth and almost a $120,000 difference ($56,000 for the median) in non-housing net wealth. For Black women at the 25th percentile, both total and non-housing wealth is $0, compared with $68,000 and $15,000 for White women. The average value of non-housing net wealth holdings of Black women at the 75th percentile of their distribution are $31,000, while the median wealth holdings for White women at 25th percentile of their distribution are $15,000. The average Black woman in the top 25th percentile of the Black wealth distribution has only twice as much as the average White woman in the bottom 25th of their wealth distribution. These are large differences by any measure.

(Table 2 about here)

Panel B in Table 2 lists the portfolio composition and asset holdings that comprise the total net wealth values given in Panel A. Primary homeownership, liquid savings, and vehicles are held in the largest percentages by older women. When separated by race, however, White women own every asset in greater percentages. Their assets also have significantly higher average dollar values. The one exception is the other debt category; 48% of Black women are represented in this category compared with 43% of Whites. This difference, however, is not statistically significant. The largest share of Black females' wealth – 45% -- is the dollar value of their vehicles, a depreciating asset. Meanwhile, the value of their home residence comprises the largest share of the White females' asset portfolio at 61%.

OLS and Quantile Regressions

Our second objective focuses on the following question: What is the relationship between marital history and wealth, net of other confounding variables (e.g., past employment)? Table 3 provides coefficient estimates from the OLS models and Tables 4 and 5 present the quantile regression models (at the 25th, 50th and 75th percentiles) for total net wealth and total non-

housing wealth. The coefficients on the race and marital history variables for our full model, which includes all the demographic, family background, and socioeconomic controls, are presented for all four model specifications.

(Table 3 about here)

By definition, the racial wealth gap in total net wealth in the bivariate model (not shown) mimics our findings from the simple cross tabulations presented earlier, with average difference of close to $200,000. At the 25th percentile, the difference in magnitude is smaller (i.e., $67,000), approximately $137,000 at the median, and $243,000 at the 75th percentile. All coefficients are negative and statistically significant. The OLS models in Table 3 indicate that older Black women hold on average between $64,000 and $67,000 less net wealth than White women ($37,000 and $40,000 in non-housing net wealth), and as the marital history are disaggregated, from model (1) to (4) the Black race coefficient estimate increases in magnitude, always remaining significant ($p<0.01$).

Moving down to the marital history results in Table 3 it is evident that compared with currently married women (the reference group), unmarried women hold on average less wealth ($p<0.10$). When disaggregated by previous union type in Model 3, the union history estimates reveal that previously married women who experience a separation (-$46,000 average total wealth holdings) or divorce (-$26,000) are significantly less well off compared to the currently married. In the last specification, Model 4, when the reference category is reduced to continuously married women, we see that having experienced a marital disruption negatively influences average net wealth holdings, with remarriage after divorce, being separated, or divorced all being significant and negatively associated with total wealth holdings. Interestingly, these negative correlations in Model 3 and 4 are not evident in the non-housing wealth samples,

with the differences in wealth holdings of divorced and separated women not significant at conventional levels, and a non-significant yet positive coefficient for widowed women. This may be an indication that marital wealth holdings are largely concentrated in housing value.

Our last two marital history variables produce results that are not surprising and are in line with previous research. Marrying later is positively associated with financial well-being as is the length of time spent in marital union. Although the magnitudes on these variables are not large, they do indicate that they may be a contributing factor to a woman's net wealth holdings by middle age.

In the interest of parsimony, we do not present the estimated coefficients for our additional controls. All are in the predicted directions. For example, age, being foreign born, having more years of education, and a greater percent change in total income are all significant and associated with higher levels of wealth. Residing in the South, having more children, and more total chronic conditions are also significant and associated with lower levels of wealth. Years spent working is inversely related to current wealth levels, however, this result is only weakly significant and compared to the currently employed, retired, disabled, and those out of the labor force all have higher wealth levels.

Tables 4 and 5 present the quantile regression estimates for the same four model specifications as the OLS results, but now we are able to assess the conditional expectation of race and marital status at three specific quantiles along the wealth distribution. Starting in the first row, Table 4 reveals that not only do Black women have less wealth on average than White women, but this racial disparity holds at the lower, median, and upper quantiles of the wealth distribution. This relationship holds even with the removal of housing wealth, as indicated in Table 5. The wealth differentials at the 25^{th} percentile are small, around $18,000 for total wealth

and $5,000 for non-housing net wealth, yet always significant. The racial wealth difference increase in size at the median to approximately $35,000 ($14,000 for non-housing wealth) and upwards of $75,000 ($35,000) at the 75th percentile. The estimates from the OLS models are almost twice as large at the median estimates for both total and non-housing wealth. This highlights that women at the upper tail of the distribution are skewing the OLS results.

(Tables 4 and 5 about here)

Compared to the OLS estimates in Table 3, the quantile estimates on the marriage and marital history variables are statistically stronger; they show that women at the 25th and median quantile fare far worse than the currently married. In Model 2, the sign on the never married coefficient flips in sign from the OLS results, now indicating a negative relationship at the 25th, 50th, and 75th quantile. The negative association between never married and wealth holdings also holds in Model 3 with the coefficients in all three quantile regressions increasing almost threefold in magnitude. It becomes statistically significant at the lower tail and median in the distribution when the reference category changes to continuously married women (Model 4). In the non-housing wealth quantile regressions in Table 5, this pattern no longer exists, with never married older woman conditional non-housing wealth holdings never statistically significant from their currently married or continuously married counterparts. This again highlights how currently married women's wealth does appear to be concentrated in the dollar value of their homes.

The marital history estimates in Model 3 reveal that women who are presently unmarried but who experienced a previous marital disruption due to separation, divorce, and widowhood have lower total wealth compared to women currently married. This relationship is evident at the 25th percentile and median of the wealth distribution. In comparison, the OLS estimates in

Table 3 do not indicate a significant correlation between the currently married and widows and current cohabitors, whereas the quantile results reveal that women in these groups at the lower ends and middle of the distribution fare worse than their married counterparts. Additionally, there is only weak evidence from the magnitude of the coefficients that marital disruptions are significantly worse for older women at the 75^{th} quantile.

This relationship is also evident in the non-housing wealth regressions, in which the OLS estimates again indicate no significant wealth differentials in the marital history controls. The quantile regressions in Table 5 show significant and negative estimates for women previously married or with a union history at the 25^{th} and median quantiles (Model 1). The non-housing wealth quantile regressions also reveal that marital history becomes less significant at the upper end of the wealth distribution. In both the total wealth and non-housing wealth models (Model 3), separated and divorced women have consistently negative coefficients across the distribution, whereas widowed are negative and significant at the lower ends of the distribution. In Model 2, when the never married are delineated from the currently unmarried, there are no significant differences in wealth holdings relative to the currently married with positive holdings at the median and upper tail of the distribution.

In our final specification, Model 4, which fully disaggregates the marital histories, the relationship between marital history and wealth becomes more pronounced. Having a history of at least one previous marital disruption is associated with significantly less wealth than women who are continuously married and have no prior marital union. These results also highlight the cumulative negative impact of a previous disruption. For example, results from the OLS and quantile regression indicate that "remarried, after divorce" is always negatively correlated with wealth holdings relative to the continuously married. Interestingly, remarriage appears to have

differential effects depending on the current union status of the woman. Those who remarried after widowhood do not appear to hold wealth with any significant difference that the continuously married. Having a history of union disruption on average negatively impacts women's wealth levels even if they eventually remarry. The negative relationship appears to be independent of a woman's place in the wealth distribution.

From the OLS model cohabitation does not appear to be statistically correlated with wealth holdings. Yet, when we compare those results to the quantile regressions in Model 3, it is evident that current cohabitors at the 25th quantile and median of the wealth distribution have significantly lower wealth. Once the currently cohabiting/partnered sample is disaggregated by prior union history as in Model 4, we see again that experiencing a marital disruption also negatively influences their wealth holdings. And finally, age at first marriage, is never statistically correlated with wealth holdings. The overall conditional estimates are small in both Table 4 and 5 – across all four model specifications. The quantile regression estimates for years spent in longest marriage are fairly congruent with the OLS estimates. Both models suggest statistically significant positive wealth holdings the longer the marriage, with increasing returns for women at the median and upper tail of the wealth distribution.

Decomposition Analysis

Our third objective addresses a straightforward question: To what extent would racial disparities in wealth converge if Black women had the same marital histories as White women? The answer can be gleaned from results of the decomposition of the Black-White wealth gap. In Table 6, we present the results from all four marital history models and calculate the percentage of the wealth gap (differences in the predicted total wealth and non-housing wealth between

Black and White women) explained by the marital history variables, followed by the contribution of the additional demographic, labor market and health history covariates.

(Table 6 about here)

The results suggest several straightforward conclusions. The full model for total wealth accounts for just over one-half of the variation in the explained portion of the wealth gap (for both total and non-housing wealth) when using the Black coefficients and over seventy percent with the White coefficients. Of this portion, the racial differences in marital status and union history account for roughly 8%-10% of the racial difference in wealth (3%-5% for non-housing wealth).

These results have heuristic value. They imply that Black women who followed union history trajectories similar to White women would have higher levels of wealth. Specifically, the racial wealth gap ($201,867 for total wealth) would decrease by close to $20,600 or 10%. At the same time, marital histories do not account for the currently large racial differences in wealth among older women. Not surprisingly and in line with previous studies (Altonji & Doraszelski, 2005; Blau & Graham, 1990), when the regression coefficients from the White model are used as weights, they are able to explain more of the total wealth differential (73% compared with 54%). This difference highlights to a great extent how White women's observable characteristics are better at explaining their wealth-creating abilities. Alternatively stated, the wealth-generating returns to marital history (as well as the demographic, labor and health history variables) are greater for White than Black women.

The non-housing wealth decomposition indicates that marital history is able to explain even less of the racial wealth gap, with at most 5% of the marital history explaining the $117,343 non-housing wealth gap. Although racial differences in marital history do not account for much

of the wealth divide, these results reinforce the substantive point that the explained portion of the racial wealth gap contributed by marital history is concentrated in housing wealth among White women. It is interesting to note that the contribution of the marital history to the racial wealth gap appears to be independent of the model chosen. For the total wealth decomposition, the overall contribution of marital history ranges from 8% to 11%. This is not surprisingly given the fact that each model is disaggregation of the prior, i.e., Model 2 builds on Mode1, Model 3 builds on Model 2, and Model 4 on Model 3. If anything, the largest difference should be with Model 4 due to the switch in reference category, however, the overall magnitude stay within less than a two percentage point difference between all four models.

We also evaluated cohort differences to assess whether the racial wealth gap has changed as a result of cross-cohort changes in marital histories among women born during 1931-1941, 1942-1947, and 1948 to 1953. The within-cohort wealth gaps are all positive indicating that the successive cohorts, WB and EBB, are saving more relative to the oldest cohort, HRS, and that the youngest cohort, EBB, holds the most wealth, and that the racial wealth gap has been diverging over time. Not only is the EBB cohort holding more assets, but White EBBs are holding more assets relative to Black EBBs. There is, however, a decline in the non-housing wealth holdings of White women between the EBB cohort and the WB. This change when combined with the increase in non-housing asset holdings of Black women, actually causes the racial wealth gap to decrease in magnitude for this cohort.

(Table 7 about here)

The decomposition results of the within cohort racial wealth gaps also highlight the changing role of marital histories on wealth. For the oldest cohort (HRS), marital histories accounted for at least nine percent of the explained difference in wealth levels between the two

races, independent of the coefficients used as weights. This result shows that in spite of the large wealth differential between races, both Black and White women's wealth returns to their union history characteristics were similar. For the WB cohort, the White coefficients explain more of the wealth differential (7 %) than when the Black coefficients are used (3 %). For the decomposition of the $224,318 racial wealth gap of the youngest cohort (EBB), when using the Black coefficients as weights (8%), they do not do as good a job as the HRS cohort at 9% but surpass the WB weak performance of 3%. Whereas when White coefficients are the standard, they do a better job of explaining the gap than the previous two cohorts. These results suggest that had EBB Black women had similar marital histories as EBB White women, the racial wealth gap would decline by approximately $28,400, also highlighting the changing nature of racial disparities in marriage across the cohorts.

The aforementioned patterns regarding the contribution of marital history are observed to a lesser degree in our analyses of within-cohort non-housing wealth gaps. As referenced above, for younger White women, *presumably* the decline in their non-housing wealth has been absorbed by the increase in the housing wealth apparent in the EBB total wealth column. And lastly, the contribution of marital histories to explaining the within-cohort EBB racial non-housing wealth gap is zero for Black women. Clearly, for the youngest cohort of older Black women, changes in marital histories over time have slowed the wealth accumulation process.

DISCUSSION AND CONCLUSION

Racial disparities in wealth are large in America society (Keister & Moller, 2000; Oliver & Shapiro, 2006). Unlike previous studies, our theoretical and empirical approach to wealth disparities draws on a large literature that emphasizes diverging racial and ethnic patterns of family formation (for reviews, see Burstein, 2007; Elwood & Jencks, 2004). We argue that

marital histories and wealth accumulation are inextricably linked. For older middle-aged women, the so-called "retreat from marriage" – delayed marriage, cohabitation, and divorce – has presumably had large, negative effects over the life course on the wealth accumulation process. Growing ethnoracial disparities in marriage and family life have placed Black women at risk of asset poverty at the same time that the large baby boom cohort has begun to enter their retirement years. The main focus of this paper was to draw attention to an especially vulnerable population – older middle-aged Black women – who have experienced changes in union formation firsthand over recent decades (Ellwood & Jencks, 2004), and to assess how changing union dynamics have affected their economic well-being, as measured by accumulated wealth. This was accomplished using several waves of the HRS.

Our findings highlight several specific results. First, we show large and increasing Black-White differences in total wealth. The average net wealth of Black women is only about 25 percent as large as the corresponding figure for White women. These large wealth disparities clearly are in line with previous research that has found a large wealth disparity between Black and White households overall.

Second, our results show that marital and relationship histories are strongly associated with the wealth accumulation process among older women – both among Black and White women. Whether they remarried or not, women who divorced accumulated less wealth than women who married and stayed married. The marriage-wealth nexus was highly sensitive, however, to a women's position in the wealth distribution. The quantile regression results suggest that racial differences in total wealth holdings between Black and White women exist throughout the total wealth and non-housing wealth distribution. The relationship between current union history and wealth differentials appears to be significant at the lower tail and

middle of the distribution and prior union history and wealth also throughout the distribution. OLS regression estimates tend to mask the marital history and wealth holdings relationship for women located at the bottom half of the distribution.

Third, our decomposition analyses highlight the role of racial disparities in marital histories in accounting for the racial wealth gap. If Black women had the same marital and relationship histories as White women, Black-White differences in wealth would be reduced by roughly 9%. The wealth returns to marriage are stronger for older White women in the sample, and appear to be closely tied to housing value first, and a lower rate of experiencing a marital disruption. Obviously, our demographic accounting framework cannot make strong causal claims. Whether Black women marry and stay married also is affected by their own employment and earnings over the life course, a larger contributing factor to the racial wealth gap as evidenced by our decompositions, as well as those of those of the men available to them in marriage. Indeed, our results show that changing cross-cohort marriage patterns account for a larger share of changes in wealth among Black women than White women. This is not surprising given the more rapid declines in marriage among America's Black population. The implication, of course, is that the putative economic (and wealth) benefits of marriage have declined over time among disadvantaged populations. Despite increasing racial and ethnic diversity in the US population, we are limited to Black and White women in this analysis. Because we are using an older sample of Americans, born 1931-1953, there is large heterogeneity in the Hispanic population. The Hispanic sample size is also too small to disaggregate into our complex union history models, with several empty cells, and we are only able to delineate Mexican Americans from other Hispanic.

As the baby boom enters their retirement years, it will be more important than ever to monitor the changing economic circumstances, including their accumulated wealth, among single and minority women. The baby boom cohort was at the front line of family change, and many are now entering retirement age as single women without a large nest egg. Although two-thirds of the women in our sample were currently or previously married, the current retreat from marriage is unlikely to slow among today's young adults. Indeed, the family lives and economic circumstances of younger cohorts of American women, including Blacks and other minorities, are being reshaped by family instability and relationship churning (Cherlin, 2009).

The latest HRS cohort in our sample was interviewed in 2004, after the 2001 recession, but prior to the Great Recession, the housing bubble burst, and the rise in foreclosures nationwide. How the racial wealth gap, especially among older women, will be affected in the long run by the current economic downturn is unclear. Finally, our results highlight the importance of considering both current marital status and union history when assessing the racial wealth gap, especially at older ages. Racial disparities in wealth cannot be explained entirely or even mostly by current or past marriage patterns. Instead, family and economic life are mutually reinforcing, which contributes to the large and perhaps growing racial differences in wealth. With the aging of the U.S. population and increasing longevity, a growing percentage of the lives of average Americans will be lived as elderly – and single – persons. Whether or not they are economically situated to survive and thrive well into these later years will depend in part on the wealth that they have accumulated over their lifetimes.

REFERENCES

Allen, B. L. (2002). Race and gender inequality in homeownership: Does place make a difference? *Rural Sociology, 67,* 603-621. doi:10.1111/j.1549-0831.2002.tb00121.x

Altonji, J. G., & Doraszelski, U. (2005). The role of permanent income and demographics in black/white differences in wealth. *The Journal of Human Resources, 40,* 1-30.

Angel, J.L., Jimenez, M.A., & Angel, R.J. (2007). The economic consequences of widowhood for older minority women. *The Gerontologist, 47,* 224-234. doi:10.1093/geront/47.2.224,

Barsky, R., Bound, J., Charles, K., & Lupton, J. (2002). Accounting for the black-white wealth gap: A nonparametric approach. *Journal of the American Statistical Association, 97,* 663-673. doi:10.1198/016214502388618401

Blau, F.D., Ferber, M. A., & Winkler, A. E. (2002). The economics of women, men, and work. 4th Edition.

Blau, F., & Graham, J. (1990). Black-white differences in wealth and asset composition. *The Quarterly Journal of Economics,105,* 321-339. doi:10.2307/2937789

Blinder, A. (1973). Wage discrimination: reduced form and structural estimates. *Journal of Human Resources,8,* 436-455. doi:10.2307/144855

Burkhauser, R., Duncan, G., Hauser, R., & Bernsten, R. (1991). Wife or frau, women do worse: A comparison of the United States and Germany after marital dissolution. *Review of Income and Wealth,28,* 353-360. doi:10.2307/2061461

Burstein, N. (2007). Economic influences on marriage and divorce. *Journal of Policy Analysis and Management, 26,* 387-429. doi:10.1002/pam.20257

Butrica, B. & Smith, K. E. (2012). Racial and ethnic differences in the retirement prospects of divorced women in the baby boom and generation X cohorts. *Social Security Bulletin, 72,* 23-36.

Campbell, L., & Kaufman, R. (2006). Racial differences in household wealth: Beyond black and white. *Research in Social Stratification and Mobility, 24,* 131-152. doi:10.1016/j.rssm.2005.06.001

Chang, M. (2010). Lifting as we climb: Women of Color, Wealth, and America's Future. http://www.insightcced.org/uploads/CRWG/LiftingAsWeClimb-WomenWealth-Report-InsightCenter-Spring2010.pdf

Cherlin, A. (2009). *The marriage-go-round: The state of marriage and the family in America today.* New York: Knopf.

Chiteji, N. S., & Hamilton, D. (2002). Family connections and the black-white wealth gap among middle-class families. *The Review of Black Political Economy, 30,* 9-28. doi:10.1007/BF02808169

Clair, P., Chien, S., Bugliari, Zissimopoulos, J., & McGarry, K. (2010). Rand HRS Family Data Documentation, Version J .

Deaton, A. (2002). Policy implications of the gradient of health and wealth. *Health Affairs, 21,* 13-30. doi:10.1377/hlthaff.21.2.13

Duncan, G., & Hoffman, S. (1985). A Reconsideration of the Economic Consequences of Marital Dissolution. *Demography, 22,* 485-497. doi:10.2307/2061584

Ellwood, D.T., & Jencks, C. (2004). The uneven spread of single-parent families: What do we know? Where do we look for answers? In K. M. Neckerman, ed., *Social Inequality,* pp. 3-78. New York: Russell Sage.

Gittleman, M., & Wolff, E. (2004). Racial differences in patterns of wealth accumulation. *Journal of Human Resources, 39,* 193-227. doi:10.2307/3559010

Hamilton, D., Goldsmith, A., & Darity, W. (2009). Shedding "light" on marriage: The influence of skin shade on marriage for black females. *Journal of Economic Behavior & Organization,72,* 30-50. doi:10.1016/j.jebo.2009.05.024

Hirschl, T.A., Altobelli, J., & Rank, M. R. (2003). Does marriage increase the odds of affluence? Exploring the life course probabilities. *Journal of Marriage and Family, 65,* 927-938. doi:10.1111/j.1741-3737.2003.00927.x

Hirschl, T.A. & Rank, M. R. (2010). Homeownership across the American life course: Estimating the racial divide. *Race and Social Problems, 2,* 125-136. doi:10.1007/s12552-010-9033-z

Hoffman, S., & Duncan, G. (1988). What are the economic consequences of divorce? *Demography,25,* 641-645. doi:10.2307/2061328

Hogan, R., & Perrucci, C. (2007). Black women: Truly disadvantaged in the transition from employment to retirement income. *Social Science Research,36,* 1184-1199. doi:10.1016/j.ssresearch.2006.07.002

Holden, K., & Kuo, H. (1996). Complex marital histories and economic well-being: The continuing legacy of divorce and widowhood as the HRS cohort approaches retirement. *The Gerontologist, 36,* 383-390. doi:10.1093/geront/36.3.383

Holden, K.C., & Smock, P.J. (1991). The economic costs of marital dissolution: Why do women bear a disproportionate cost? *Annual Review of Sociology, 17,* 51-78. doi:10.1146/annurev.soc.17.1.51

Idler, E.L., & Benjamini, Y. (1997). Self-rated health and mortality: a review of twenty-seven community studies. *Journal of Health and Social Behavior, 38,* 21–37. doi:10.2307/2955359

Keister, L. (2003). Religion and Wealth: The role of religious affiliation and participation in early adult asset accumulation. *Social Forces, 82,* 175-207. doi:10.1353/sof.2003.0094

Keister, L., & Moller, S. (2000). Wealth Inequality in the United States. *Annual Review of Sociology, 26,* 63-81. doi:10.1146/annurev.soc.26.1.63

Koenker, R., & K. Hallock. (2001). Quantile regression. *The Journal of Economic Perspectives, 15,* 143-156. doi:10.1257/jep.15.4.143

Lichter, D.T., McLaughlin, D., Kephart, G., & Landry, D. (1992). Race and the retreat from marriage: A shortage of marriageable men? *American Sociological Review, 57,* 781-799. doi:10.2307/2096123

Lichter, D.T., Qian, Z-C. , & Mellott, L. (2006). Marriage or dissolution? Union transitions among poor cohabiting women. *Demography, 43,* 223-240. doi:10.1353/dem.2006.0016

Lichter, D.T., Turner, R.N., & Sassler, S. (2010). National estimates of the rise in serial cohabitation. *Social Science Research,* 39, 754-765. doi:10.1016/j.ssresearch.2009.11.002

Lundberg, S., & Pollak, R. (1996). Bargaining and distribution in marriage. *The Journal of Economic Perspectives, 10,* 139-158. doi:10.1257/jep.10.4.139

Lupton, J., & Smith, J. P. (2003). Marriage, assets and savings. In S. Grossbard-Shecht (Ed.), Marriage and the economy: Theory and evidence from advanced industrial societies (pp. 129-152). New York: Cambridge University Press.

McCall, L., & Percheski, C. (2010). Income inequality: New trends and research directions. *Annual Review of Sociology, 36,* 329-347. doi:10.1146/annurev.soc.012809.102541

Menchik, P.L., & Jianakoplos, N.A. (1997). Black-white wealth inequality: Is inheritance the reason? *Economic Inquiry, 35,* 428-442. doi:10.1111/j.1465-7295.1997.tb01920.x

Neckerman, K., & Torche, F. (2007). Inequality: causes and consequences. *Annual Review of Sociology, 33,* 335-357. doi:10.1146/annurev.soc.33.040406.131755

Oaxaca, R. (1973). Male-female wage differentials in urban labor markets. *International Economic Review, 14,* 693-709. doi:10.2307/2525981

Oliver, M., & Shapiro, T. (2006). *Black wealth/white wealth: A new perspective on racial inequality*. New York and London: Routledge.

Schoen, R., & Standish, N. (2001). The retrenchment of marriage: Results from marital status life tables for the United States, 1995. *Population and Development Review,* 27, 553-563. doi:10.1111/j.1728-4457.2001.00553.x

Schmidt, L., & Sevak, P. (2006). Gender, marriage, and asset accumulation in the United States. *Feminist Economics, 12,* 139-166. doi:10.1080/13545700500508445

Shapiro, T. (2004). *The Hidden Cost of being African: How Wealth Perpetuates Inequality*. New York: Oxford University Press.

Smith, J. (1995). Racial and ethnic differences in wealth in the health and retirement study. *The Journal of Human Resources, 30,* S158-S183. doi:10.2307/146282,

Stevenson, B., & Wolfers, J. (2007). Marriage and divorce: changes and their driving forces. *The Journal of Economic Perspectives, 21,* 27-52. doi:10.1257/jep.21.2.27

Sweeney, M. M. (1997). Remarriage of women after divorce: The role of socioeconomic prospects. *Journal of Family Issues, 18,* 479-502. doi:10.1177/019251397018005002

Sweeney, M.M., & Phillips, J. (2004). Understanding racial differences in marital disruption:

Recent trends and explanations. *Journal of Marriage and Family*, *66*, 639-650. doi:10.1111/j.0022-2445.2004.00043.x

Tamborini, C. R., Iams, H. M., & Whitman, K. (2009). Marital history, race, and social security spouse and widow benefit eligibility in the United States. *Research on Aging*, *31*, 577-605. doi:10.1177/0164027509337196

Ulker, A. (2009). Wealth holdings and portfolio allocation of the elderly: the role of marital history. *Journal of Family and Economic Issue*s, *30*, 90-108. doi:10.1007/s10834-008-9139-2

U.S. Census Bureau. (2010a). http://www.census.gov/ hhes/www/cpstables/032010/ pov/ new02_100_06.htm Accessed 10/5/2010).

U.S. Census Bureau. (2010b). http://www.census.gov/ hhes/www/cpstables/ 032010/ pov/ new02_100_04.htm.

U.S. Census Bureau. (2010c). http://www.census.gov/population/www/socdemo/hh-fam/cps2009.html).

Vespa, J., & Painter, M. (2011). Cohabitation history, marriage, and wealth accumulation. *Demography*, 48, 983-1004. doi:10.1007/s13524-011-0043-2

Waite, L., & Gallagher, M. (2000). *The Case of Marriage: Why Married People are Happier, Healthier, and Better off Financially*. New York: Doubleday.

Wilmoth, J., & Koso, G. (2002). Does marital history matter? Marital status and wealth outcomes among preretirement adults. *Journal of Marriage and Family*, *64*, 254-268. doi:10.1111/j.1741-3737.2002.00254.x

Woldoff, R. A., & S. Ovadia. (2008). Not getting their money's worth: African-American

disadvantages in converting income, wealth, and education into residential quality. *Urban Affairs Review*, 45, 66-91. doi:10.1177/1078087408328947

Zagorsky, J. (2005). Marriage and divorce's impact on wealth. *Journal of Sociology, 41*, 406-424. doi:10.1177/1440783305058478

Table 1: Descriptive Statistics for Marital History Models, by Race								
	Total				Black		White	
Panel A. Marital History	M		SD		M	SD	M	SD
Model #1								
Currently married	0.675	*			0.374		0.719	
Not Married	0.325	*			0.626		0.281	
Model #2								
Currently married	0.675	*			0.374		0.719	
Previously married	0.283	*			0.511		0.249	
Never married	0.042	*			0.115		0.032	
Model #3								
Currently married	0.675	*			0.374		0.719	
Previously married:								
Separated	0.025	*			0.089		0.016	
Divorced	0.160	*			0.249		0.147	
Widowed	0.071	*			0.142		0.061	
Partnered/cohabiting	0.026				0.031		0.026	
Never married	0.042	*			0.115		0.032	
Model #4								
Currently married:								
Continuously married	0.514	*			0.272		0.550	
Remarried, after divorced	0.144	*			0.091		0.152	
Remarried, after widowed	0.017	*			0.011		0.018	
Separated	0.025	*			0.089		0.016	
Divorced	0.160	*			0.249		0.147	
Widowed	0.071	*			0.142		0.061	
Partnered/cohabiting:								
Cohabiting, never married	0.004				0.009		0.003	
Cohabiting, previously married	0.023				0.022		0.023	
Never married	0.042	*			0.115		0.032	
Additional Marital History Measures								
Age at first marriage	20.672	*	5.252		20.511	5.044	21.878	6.486
Years spent in longest marriage	24.477	*	11.389		25.415	10.850	18.126	12.835
Panel B. Additional Covariates								
Age	54.090		2.811		54.110	2.819	53.956	2.751
Foreign born	0.048				0.046		0.060	
Years of education	13.058	*	2.406		13.170	2.337	12.295	2.707
Total number of children ever had	2.689	*	1.783		2.624	1.712	3.129	2.154
Currently resides in the South	0.364	*			0.333		0.572	
Protestant	0.655	*			0.621		0.890	
Catholic	0.246	*			0.274		0.055	
Religion-other	0.099	*			0.106		0.056	
Permanent income ($)	85,470	*	46,844		90,996	46,270	48,025	30,792
Currently employed	0.581				0.580		0.588	
Unemployed	0.022				0.021		0.031	
Retired	0.124	*			0.119		0.160	
Disabled	0.040	*			0.033		0.091	
Out of the labor force	0.139	*			0.147		0.088	
Self- employed	0.094	*			0.101		0.042	
Total number of years worked	24.303		11.777		24.410	11.623	23.581	12.756
Self-assessed health (1-5)	2.508	*	1.153		2.418	1.128	3.113	1.134
Total number of chronic conditions (0-8)	1.107	*	1.148		1.051	1.120	1.481	1.258
Financial respondent	0.584	*			0.554		0.792	
HRS cohort (1931-1941)	0.426	*			0.432		0.386	
WB cohort (1942-1947)	0.260	*			0.259		0.261	
EBB cohort (1948-1953)	0.314				0.308		0.353	
N	7,026				1,473		5,553	

*Note: Sample data are from waves 1 (1992), 4 (1998), and 7 (2004) of the Health and Retirement Study; Weighted Sample Means; Numerical values reported in 2008 dollars; *Denotes statistically significant difference between Black and White samples at 5% level.*

Table 2. Total Net Wealth, Non-Housing Net Wealth, and Portfolio Composition, by Race

	FULL SAMPLE (*N* =7,026)			BLACK SAMPLE (*n* =1,473)			WHITE SAMPLE (*n* =5,553)		
Panel A. Wealth Variables									
Total Net Wealth									
Total net wealth (average)	$261,986*			$86,081			$287,948		
25th Percentile	$48,695			$0			$67,341		
50th Percentile (median)	$154,267			$33,349			$182,897		
75th Percentile	$347,773			$108,658			$376,780		
Total Non-Housing Net Wealth									
Total Non-Housing Wealth (average)	$142,266*			$39,928			$157,371		
25th Percentile	$9,361			$0			$14,756		
50th Percentile (median)	$48,794			$5,366			$61,761		
75th Percentile	$165,983			$31,458			$187,220		
Panel B. Asset Holdings									
	Mean Value	**Percent with asset**	**Percent of Net Wealth**	**Mean Value**	**Percent with asset**	**Percent of Net Wealth**	**Mean Value**	**Percent with asset**	**Percent of Net Wealth**
Primary Residence	$119,720 *	0.833 *	0.565	$46,153	0.588	0.238	$130,577	0.869	0.613
Stocks	$38,046 *	0.356 *	0.063 *	$8,596	0.137	0.018	$42,392	0.389	0.069
Liquid Savings	$75,585 *	0.897 *	0.224 *	$20,439	0.642	0.117	$83,724	0.935	0.240
Vehicles	$20,312 *	0.911 *	0.347	$10,932	0.681	0.452	$21,696	0.945	0.331
Other Savings	$13,029 *	0.209 *	0.032 *	$4,295	0.099	0.016	$14,318	0.225	0.034
Other Debt	$4,706	0.432 *	0.257	$4,334	0.477	0.021	$4,760	0.425	0.298

*Note: Sample Data are from waves 1 (1992), 4 (1998), and 7 (2004) of from the Health and Retirement Study; Numerical values reported in 2008 dollars; *Denotes statistically significant difference between Black and White samples at 5% level.*

Table 3. Multivariate Regression Results: Coefficient Estimates of the Race and Marital History Variables from OLS Regressions								
	Total Wealth					**Total Non-Housing Wealth**		
	(1)	(2)	(3)	(4)		(1)	(2)	(3)	(4)
Black	-64,677***	-65,564***	-64,229***	-66,768***		-37,720***	-38,662***	-37,934***	-39,163***
	[8,438]	[8,488]	[8,558]	[8,594]		[6,731]	[6,770]	[6,827]	[6,857]
Model #1									
Ref: Currently Married									
Unmarried	-21,648+					-3,193			
	[11,407]					[9,098]			
Model #2									
Ref: Currently Married									
Previously Married		-20,392+					-1,859		
		[11,480]					[9,156]		
Never Married		2,384					22,325		
		[27,208]					[21,701]		
Model #3									
Ref: Currently Married									
Separated			-45,929*					-15,303	
			[19,784]					[15,782]	
Divorced			-26,067+					-6,515	
			[13,543]					[10,803]	
Widowed			-14,742					476	
			[14,190]					[11,320]	
Partnered/Cohabiting			24,630					31,194+	
			[22,902]					[18,269]	
Never Married			8,530					25,853	
			[27,615]					[22,029]	
Model #4									
Ref: Continuously Married									
Remarried, after divorced				-35,029**					-16,033+
				[11,443]					[9,130]
Remarried, after widowed				-6,713					11,546
				[22,796]					[18,188]
Separated				-55,874**					-18,971
				[20,109]					[16,044]
Divorced				-44,309**					-12,268
				[15,415]					[12,299]
Widowed				-29,147+					-4,134
				[15,313]					[12,218]
Cohabiting, never married				84,089					118,489*
				[60,243]					[48,066]
Cohabiting, previously married				-7,383					10,389
				[24,817]					[19,801]
Never Married				-23,411					20,208
				[32,130]					[25,636]
Age at first marriage	838.4+	1,236*	1,464*	1,215+		378	800	951+	1,040+
	[461]	[615.7]	[623]	[673]		[368]	[491.1]	[497]	[537]
Years spent in longest marriage	1,423***	1,604***	1,743***	1,046*		398	590+	668*	487
	[350]	[396.3]	[413]	[516]		[279]	[316.1]	[329]	[412]
Constant	-433,945***	-439,544***	-437,023***	-420,048***		-389,623***	-395,567***	-395,434***	-389,209***
	[68,748]	[68,989]	[69,220]	[69,466]		[54,836]	[55,025]	[55,217]	[55,425]
R-squared	0.259	0.259	0.260	0.261		0.181	0.181	0.182	0.183
N	7,026	7,026	7,026	7,026		7,026	7,026	7,026	7,026

Note: Sample Data are from waves 1 (1992), 4 (1998), and 7 (2004) of the Health and Retirement Study; All models includes additional controls including respondent's age, foreign born, years of education, number of children ever had, permanent and transitory income, Southern resident, current religion, current employment status, number of chronic conditions, self-assessed health, financial respondent, and birth cohort; *** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$; Standard errors are reported in parentheses.

Table 4. Multivariate Regression Results for Total Net Wealth: Coefficient Estimates of the Race and Marital History Variables from Quantile Regressions

	25th Quantile				50th Quantile (Median)				75th Quantile			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Black	-17,481***	-18,399***	-18,157***	-19,397***	-34,545***	-35,614***	-35,376***	-34,389***	-74,997***	-74,759***	-70,888***	-72,696***
	[2,485]	[1,990]	[2,574]	[2,887]	[3,740]	[3,850]	[3,852]	[4,744]	[5,928]	[10,229]	[10,184]	[7,384]
Model 1												
Ref: Currently married												
Unmarried	-27,224***				-31,335***				-28,556***			
	[5,247]				[6,325]				[9,832]			
Model 2												
Ref: Currently married												
Previously married		-25,274***				-30,253***				-28,112**		
		[4,707]				[5,471]				[9,963]		
Never married		-11,996				-19,208+				-14,753		
		[8,258]				[10,278]				[22,306]		
Model 3												
Ref: Currently married												
Separated			-33,379***				-39,956***				-54,666	
			[3,225]				[9,120]				[38,853]	
Divorced			-25,516***				-30,654***				-30,009+	
			[4,007]				[7,617]				[15,688]	
Widowed			-22,327***				-23,584**				-20,694	
			[3,594]				[8,127]				[15,134]	
Partnered/cohabiting			-22,094**				-20,653+				16,133	
			[6,858]				[12,062]				[39,917]	
Never married			-10,601				-16,211				-9,692	
			[7,215]				[16,502]				[23,750]	
Model 4												
Ref: Continuously married												
Remarried, after divorced				-19,667***				-27,778***				-37,019**
				[4,724]				[5,391]				[13,327]
Remarried, after widowed				-6,393				-424				-5,045
				[9,700]				[18,577]				[43,142]
Separated				-39,831***				-47,839***				-63,982***
				[4,589]				[6,314]				[14,636]
Divorced				-37,844***				-42,751***				-52,267***
				[4,451]				[11,840]				[14,177]
Widowed				-31,586***				-32,614**				-38,702**
				[4,617]				[12,382]				[13,009]
Cohabiting, never married				-26,866				-30,034				50,508
				[22,118]				[69,242]				[228,774]
Cohabiting, previously married				-33,395***				-29,811+				-5,473
				[9,275]				[17,682]				[33,442]
Never married				-31,044***				-41,368*				-41,073
				[7,061]				[17,404]				[28,857]
Age at first marriage	-133	123	153	-38	-136	124	178	-173	271	705	727	430
	[133]	[149.2]	[169]	[208]	[243]	[352]	[481]	[319]	[415]	[680.1]	[959]	[663]
Years spent in longest marriage	780	883.3***	907***	578.9***	1,102***	1,211***	1,267***	823.1*	1,503***	1,632***	1,906***	1,288***
	[92]	[111]	[128]	[117]	[164]	[174]	[223]	[362]	[335]	[289]	[325]	[320]
Constant	-115,001	-129,084***	-126,826***	-115,662***	-268,726***	-270,238***	-266,425**	-262,542***	-275,114***	-296,043**	-289,289**	-254,873**
	[21262]	[29,052]	[23,080]	[26,983]	[38,374]	[47,517]	[87,445]	[67,791]	[65,162]	[109,485]	[94,834]	[84,965]
Pseudo r2	0.126	0.126	0.126	0.127	0.172	0.172	0.172	0.173	0.203	0.203	0.204	0.205
N	7,026	7,026	7,026	7,026	7,026	7,026	7,026	7,026	7,026	7,026	7,026	7,026

Note: Sample Data are from waves 1 (1992), 4 (1998), and 7 (2004) of the Health and Retirement Study; All models includes additional controls including respondent's age, foreign born, years of education, number of children ever had, permanent and transitory income, Southern resident, current religion, current employment status, number of chronic conditions, self-assessed health, financial respondent, and birth cohort; *** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$; Standard errors are reported in parentheses.

Table 5. Multivariate Regression Results for Total Non-Housing Net Wealth: Coefficient Estimates of the Race and Marital History Variables from Quantile Regressions

	25th Quantile				50th Quantile (Median)				75th Quantile			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Black	-5,057***	-4,979***	-4,775***	-5,087***	-13,721***	-14,326	-13,570***	-14,209***	-34,203***	-34,134***	-33,277***	-33,931***
	[878]	[892]	[1,083]	[975.2]	[1,825]	[10,188]	[1,767]	[2,215]	[4,195]	[3,669]	[4,758]	[4,977]
Model 1												
Ref: Currently married												
Unmarried	-3,788***				-6,768***				-7,962+			
	[1,056]				[2,056]				[4,261]			
Model 2												
Ref: Currently married												
Previously married		-3,598**				-5,312				-7,759		
		[1,236]				[4,788]				[7,042]		
Never married		-536				5,501				7,667		
		[2,956]				[17,434]				[11,006]		
Model 3												
Ref: Currently married												
Separated			-4,763**				-11,347***				-16,299*	
			[1,745]				[2,983]				[7,652]	
Divorced			-3,313**				-4,199*				-12,947*	
			[1,156]				[1,997]				[5,285]	
Widowed			-3,003**				-5,907+				-4,026	
			[1,079]				[3,319]				[6,492]	
Partnered/cohabiting			-1,204				4,591				30,444	
			[2,642]				[5,596]				[19,817]	
Never married			642				6,766				9,285	
			[2,755]				[4,272]				[11,319]	
Model 4												
Ref: Continuously married												
Remarried, after divorced				-2,955*				-8,611*				-15,075*
				[1,334]				[3,374]				[7,040]
Remarried, after widowed				-277				1,004				29,828
				[4,672]				[8,410]				[19,329]
Separated				-5,513***				-13,914**				-23,402*
				[1,348]				[4,390]				[9,597]
Divorced				-4,905***				-8,827*				-20,234**
				[1,482]				[3,649]				[7,019]
Widowed				-4,181*				-9,308**				-9,833
				[1,632]				[3,134]				[7,685]
Cohabiting, never married				683				15,803				35,530
				[11,268]				[20,352]				[38,991]
Cohabiting, previously married				-3,037				-1,588				21,010
				[2,330]				[6,557]				[22,560]
Never married				-1,354				412				-856
				[3,927]				[5,718]				[13,658]
Age at first marriage	-69	-7	20	25	-28	196+	204+	186	-156	211	288	241
	[56]	[55.31]	[80]	[76]	[112]	[109.3]	[115]	[142]	[193]	[284.0]	[281]	[206]
Years spent in longest marriage	159***	182***	197***	162***	275***	333**	379***	267.9***	379	563**	651***	395
	[33]	[52.58]	[39]	[38]	[75]	[122.1]	[79]	[81]	[151]	[198.8]	[191]	[246]
Constant	-43,102	-43,091***	-42,499***	-39,033***	-113,392***	-120,932	-118,591***	-121,610***	-222,823***	-232,302***	-205,745***	-228,487***
	[33]	[8,080]	[6,277]	[11,023]	[21,057]	[128,725]	[19,349]	[20,919]	[49,703]	[55,515]	[43,447]	[50,198]
Pseudo r2	0.060	0.060	0.060	0.060	0.113	0.113	0.113	0.114	0.164	0.164	0.165	0.166
N	7,026	7,026	7,026	7,026	7,026	7,026	7,026	7,026	7,026	7,026	7,026	7,026

Note: Sample Data are are from waves 1 (1992), 4 (1998), and 7 (2004) of the Health and Retirement Study; All models includes additional controls including respondent's age, foreign born, years of education, number of children ever had, permanent and transitory income, Southern resident, current religion, current employment status, number of chronic conditions, self-assessed health, financial respondent, and birth cohort; *** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$; Standard errors are reported in parentheses.

Table 6. Racial Wealth Differences Attributable to Differences in Group Characteristics				
	Total Wealth		Non-Housing Wealth	
	Black Coeff. as Standard	White Coeff. As Standard	Black Coeff. as Standard	White Coeff. As Standard
Wealth Gap ($)	201,867		117,343	
Model 1				
Marital History Total	$15,458	$20,578	$3,899	$5,511
Percent explained by Marital History	8%	10%	3%	5%
Demographics Total	$11,882	$52,128	$5,780	$30,257
Percent explained by Demographics	6%	26%	5%	26%
Labor and Health History Total	$80,743	$73,934	$64,408	$54,641
Percent explained by Labor and Health History	40%	37%	55%	47%
Full Model	$108,082	$146,640	$74,086	$90,409
Percent explained by Full Model	54%	73%	63%	77%
Percent unexplained	46.46%	27.36%	36.92%	23.02%
Model 2				
Marital History Total	$16,180	$20,095	$4,110	$5,059
Percent explained by Marital History	8%	10%	3%	4%
Demographics Total	$12,084	$51,708	$5,839	$29,861
Percent explained by Demographics	6%	26%	5%	25%
Labor and Health History Total	$80,545	$73,933	$64,228	$54,643
Percent explained by Labor and Health History	40%	37%	55%	47%
Full Model	$108,809	$145,736	$74,177	$89,564
Percent explained by Full Model	54%	72%	63%	76%
Percent unexplained	46%	28%	37%	24%
Model 3				
Marital History Total	$16,790	$22,916	$4,347	$6,993
Percent explained by Marital History	8%	11%	4%	6%
Demographics Total	$11,870	$50,994	$5,740	$29,302
Percent explained by Demographics	6%	25%	5%	25%
Labor and Health History Total	$81,162	$73,988	$64,662	$54,770
Percent explained by Labor and Health History	40%	37%	55%	47%
Full Model	$109,822	$147,898	$74,750	$91,065
Percent explained by Full Model	54%	73%	64%	78%
Percent unexplained	46%	27%	36%	22%
Model 4				
Marital History Total	$17,134	$20,963	$4,471	$5,490
Percent explained by Marital History	8%	10%	4%	5%
Demographics Total	$12,007	$49,466	$5,775	$28,214
Percent explained by Demographics	6%	25%	5%	24%
Labor and Health History Total	$79,349	$74,154	$64,278	$55,273
Percent explained by Labor and Health History	39%	37%	55%	47%
Full Model	$108,489	$144,583	$74,523	$88,977
Percent explained by Full Model	54%	72%	63%	76%
Percent unexplained	46%	28%	37%	24%

Note: Sample Data are from waves 1 (1992), 4 (1998), and 7 (2004) of the Health and Retirement Study; Numerical Values reported in 2008 dollars

Table 7. Within Cohort Racial Wealth Gap Decomposition, Total Wealth and Non-Housing Wealth for Model 1

	Total Wealth					
	HRS		WB		EBB	
	Black Coeff.	White Coeff.	Black Coeff.	White Coeff.	Black Coeff.	White Coeff.
Average White Wealth*	262,453		287,212		324,298	
Average Black Wealth*	74,154		84,922		99,980	
Wealth Gap ($)	188,299		202,289		224,318	
Marital History Total	$17,166	$19,975	$6,854	$14,758	$17,398	$28,422
Percent explained by Marital History	9%	11%	3%	7%	8%	13%
	Total Non-Housing Wealth					
	HRS		WB		EBB	
	Black Coeff.	White Coeff.	Black Coeff.	White Coeff.	Black Coeff.	White Coeff.
Average White Wealth*	140,611		176,423		164,840	
Average Black Wealth*	31,202		42,607		47,492	
Wealth Gap ($)	109,409		133,816		117,348	
Marital History Total	$4,433	$7,360	$3,490	-$869	$358	$15,913
Percent explained by Marital History	4%	7%	3%	-1%	0%	14%

Note: Sample Data are from waves 1 (1992), 4 (1998) and 7 (2004) of the Health and Retirement Study; Numerical Values reported in 2008 dollars

CHAPTER 3: INFORMAL CAREGIVING, HEALTH, AND HEALTH BEHAVIORS: THE ROLE OF TIME AND MONETARY TRANSFERS FROM ADULT CHILDREN TO AGING PARENTS- EVIDENCE FROM LONGITUDINAL DATA

Abstract

Using seven waves of individual-level data from the Health and Retirement Survey from 1998-2010 I analyze whether there is a causal effect of being an informal caregiver to an aging parent on one's health outcomes (self-assessed health and depression) and health behaviors (exercise and smoking). I examine two modes of providing caregiver assistance, basic needs or financial transfers, and the intensity of the caregiving provided. The results suggest a positive effect on depressive symptoms of initial basic needs caregiving for unmarried adult children, and that they may be selecting into that role because of their poor health. Lingering effects of caregiving in future periods include basic needs caregiving increasing the probability of smoking for married women and financial caregiving increases depressive symptoms for unmarried men. These findings suggest that the financial costs of caregiving can influence adult children's health outcomes, in particular for those not currently in a marital union.

Key Words: caregiving, depression, financial assistance, fixed effects, health behaviors, health outcomes

INTRODUCTION

The US population is experiencing a demographic transition in which a growing percentage of the US population is aging, coinciding with greater life expectancies for both men and women. (Lubitz et al, 2003; CBO, 2004) This population shift has more Americans living out a significant proportion of their life as elderly adults, who may potentially require long term assisted care (Wolff & Kasper, 2006). After spouses, adult children play a critical role in the long term care of the elderly (Stone, Cafferata, & Sangl, 1987). In 2007, familial caregivers spent on average $5,531 out-of-pocket and provided an average of 21 hours per week to adults with ADLs (AARP, 2008).

This paper explores the relationship between informal caregiving (unpaid for their services) by an adult child to an elderly parent and the effect it has on the caregiver's health and health behaviors. There is a particular focus on the difference between providing assistance with activities of daily living (ADL) versus financial transfers, as previous researchers find positive correlation exists between intensity and quantity of assistance provided and magnitude of health effects to the caregiver (Pinquart & Sorensen, 2003; Vitaliano, Zhang, & Scanlan, 2003). Using seven waves of panel data that spans ten years from the Health and Retirement Study (HRS), I analyze informal caregiving measures in which a child may direct either time or money to their mother as a form of assistance. By also estimating the lagged effect of the informal caregiver role, I am able to assess not only the initial effect on health, but also whether there exists a delayed effect that manifest in the future.

This study addresses how much of an influence physical interactions with the aging process, as proxied by the type and extent of caregiving, can have on personal healthcare and health behaviors in later life**.** Many adult children find themselves in the precarious situation of

caring for an aging parent as the aging population grows and lives longer (Preston, 1984). Although the extent of their interactions and reasons for the partnerships can vary across parent-child groupings (vanHoutven & Norton, 2007; White-Means & Chang, 1991), the most prevalent causes for an adult child becoming a parent's caregiver are the decline in health and mental capabilities as one ages (Zhu et al., 2003) and the cost of secondary care or nursing homes (McGarry, 1998). Additionally, with longer life expectancies older Americans are also finding it difficult to support themselves once their retirement savings are depleted, and must rely on financial assistance from family and friends to supplement social security benefits and medical expenditures, for example, to assist with the costs of aging (Swartz, 2011; Wakabayashi & Donato, 2006). As both parents and children age, the role of dependence may shift, leading to interesting role reversals influencing the physical and mental health of not only the parent, but also the caregiver, e.g. adult child (Pavalko & Woodbury, 2000). Additionally, this newly assumed role by the adult child may not be very well-defined and can take on several varied dimensions, from running errands, such as buying groceries, to very complex relationships such as assisting an incapacitated parent with activities of daily living such as bathing or getting into and out of bed, and providing financial assistance for medicine or food. Examining an adult child's health from adulthood into old age is important for understanding how some adults may make choices about their own healthcare, form attitudes towards certain health behaviors, and invest in long-term care. Additionally, maintaining ties with a biological parent as they age and subsequently die may provide invaluable networks of information in addition to the short-term effects on the adult child's own health.

With the use of panel data estimation techniques, I tease out the causal effect of initial caregiving and the related spillover effects of aging health information on the adult child's health

and health behaviors. Previous research has shown that maternal caregiving is one of the most common given the longer life expectancy of women, and higher chances of widowhood (Van Houtven & Norton, 2008). The analysis is restricted to caregiving of a biological mother or maternal figure.

Previous studies on Informal Caregiving, Familial Networks, and Health Outcomes

Existing literature on adult informal caregiving has tended to concentrate on the health of the parent (i.e., recipient of the care), decision-making amongst family members on who will provide care (Pezzin & Schone, 1997; Pillemer & Suitor, 2006), and the subsequent labor market effects and time tradeoffs to being in the caregiver role (Johnson & LoSasso, 2006; Kniesner & LoSasso, 2001; Spillman & Pezzin, 2000; Pezzin & Schone, 1999; Ettner, 1996; Chang & White-Means, 1995; Stoller, 1983). Studies indicate a clear hierarchy of caregiver care within most families, with a live-in spouse being the primary caregiver if the parent is married, (Schulz and Beach, 1999; Stone, Cafferata, & Stangl, 1987) followed by the eldest daughter, who oftentimes is the closest, spatially and emotionally, living relative to the patient (Lima et al, 2008; Lee, Walker, & Shoup, 2001; Yee & Schulz, 2000). With a concentration on these caregiver populations, studies emphasize the mental and physical tolls on spouses caring for a disabled or dying partner (Ory, 1999; Schulz et al, 1995; Hickenbottom et al., 2002) and the various networks of support that are formed around caring for an aging parent amongst siblings, not to mention the estimated costs associated with assuming such a role (Hickenbottom et al., 2002). Recent work examining the extent of informal caregiver networks for the elderly show that more than a half of adult-child networks change over a two year period, citing gender composition and adult-child availability as the strongest predictors of network change (Szinovacz & Davey, 2007).

Previous research on caregiver health has examined the psychological consequences, or the stress effects, of the role rather than the physical effects (Pinquart & Sorensen, 2007). Consistently, studies have shown rises in depression among female adult relatives caring for an elder, and increasing emotional distress as level of involvement intensifies. (Lee, Walker, Shoup, 2001). More recent studies on adult child caregiving using the HRS have started to look at both mental and physical health outcomes (Amirkhanyan & Wolf, 2003; Amirkhanyan and Wolf, 2006; Coe & Van Houtven, 2009). Amirkhanyan and Wolf (2003), using one year of HRS data, compared non-caregivers to caregivers to estimate the effects of a having a parent requiring basic care needs on depressive outcomes as expressed through differential stress pathways. The authors find a strong correlation between the severity of a parent's special needs and the depressive symptoms exhibited by non-caregivers adult children. Because they use only one wave of data, the authors can only compare non-caregivers to caregivers at a given point in time. In a 2006 study the authors use multiple waves of the HRS to revisit a similar question, the manifestation of depression symptoms experienced by adult children of aging parents with special care needs, not necessarily in the caregiver role, and find similar results with parental disabilities resulting in negative mental outcomes for adult children caregivers and noncaregivers.

The Coe and Van Houtven (2009) study is the closest to the present study with its utilization of multiple panels of the HRS and panel model econometric estimation techniques and its examination of several health outcomes. Using the basic needs caregiver questions, the authors estimate both the short and long-term health effects of caregiving, looking at self-assessed, depression, heart disease and high blood pressure for their outcomes. The authors control for selection into and out caregiving with family-level characteristics as instruments and

estimate their models using lagged dependent variables, allowing them to capture the persistence of caregiving on the adult child's health out two waves from initiation. Coe and Van Houtven (2009) find consistently negative persistent effects of caregiving on depressive symptoms for married men and women.

Yet, none of the aforementioned studies make the connection between family dynamics and the possible link to intergenerational transfers of health and health behaviors. Kniesner and LoSasso (2001) do explore the intergenerational affect of caregiving on labor market outcomes and found no effect on adult son's time allocation to parent, yet adult daughter's who visited parent did reduce their labor market time. Kniesner and LoSasso (2001) use the PSID, however, and broadly define caregiving by the number of daily visits made to the parent. The literature on familial interaction and health history and its effects on caregiver health is lacking with regards to intergenerational health transfers and parent-adult child relationship, which we attempt to explore within this study.

THE CURRENT STUDY

This study addresses the causal effect of informal basic needs and financial caregiving (and intensity) on self-assessed health, depressive symptoms, vigorous exercise, and smoking. According to the stress process model, an adult child caring for an aging parent experiences stress that can manifest itself in physical and mental strains to one's own health, more so then those persons who do not take on this role (Amirkhanyan & Wolf, 2003). At the same time, these caregivers may gain an acute awareness of their own health and mortality and thus, may be more willing to utilize the services of healthcare professionals. I posit that in addition to the *caregiver* stress-induced health effects (Bobinac et al., 2010), an unintended consequence, or spillover, of the caregiver time or money transfer is the ability to gain information on the aging process,

acquire access to health information that a non-caregiver may not be receiving or is receiving to a lesser extent. These spillover effects influence the adult child's initial health indicators and health behaviors and future outcomes. This effect is different than the *caregiver* effect, direct health effects of performing caregiver tasks, or *family* effects, the warm glow effect of the recipient's improved health on your well-being, which are both also associated with informal caregiving (Bobinac et. al, 2010) in that individuals are unaware of this "information spillover" effect prior to assuming the caregiver role.

It is unclear from the theoretical arguments what effect will dominate; and thus, I test empirically the relationships between the informal caregiving role and health outcomes and health behaviors. There may be a bimodal effects with the "excellents" on one side of the spectrum consisting of adult children who become overly health conscious and invest in preventive care given their exposure and interactions with the elderly and aging process, such as vigorous exercising; whereas, the "fair/poors" heap at the other end of the health spectrum and consist of individuals who have formed a more consequential sense of death and mortality and may engage in riskier health behaviors like smoking (Schnoll, Malstrom, & James, 2002).

Time versus financial transfers and informal caregiving

All of the studies that have examined the health effects of informal caregiving referenced above examined basic needs caregiving, or rather time transfer caregiving. There are several different ways that adult children might interact with an elderly parent. A non-trivial and growing sector of the adult population is providing financial assistance and many basic needs caregivers also find the role to be an expensive one (Swartz, 2011; Arno, Levine, & Memmott, 1999). Studies that have examined financial transfers to elderly parents have mainly examined the labor market effects (Couch, Daly, & Wolf, 1999) (e.g. wage rates, hours worked) or the

tradeoff between providing time assistance versus financial (Sloan, Zhang, & Wang, 2002; Sloan, Picone, & Hoerger, 1997) and the theoretical motivations to provide one transfer versus the other (Caputo, 2002; Bernheim, Shleifer, & Summers, 1985). Sloan, Zhang, and Wang (2002) find that adult children financial caregivers are less motivated by exchange, then by altruism. Their findings also suggest that adult children are substituting one form of transfer for another, with higher wage earners more like to provide financial transfers over time. Couch, Daly, & Wolf (1999) also find this positive correlation between financial transfers and household income. Adult children with money may be financial capable of providing financial transfers to pay to avoid having to provide ADL assistance, whereas basic needs caregivers can't afford to pay for help.

While most survey results indicate negative health effects related to caregiving, these results may be biased if the type of caregiving provided is not taken into account and adult health is not assessed pre and post-caregiving. If basic needs caregivers tend to be healthier individuals in general as the healthy caregiver hypothesis states, then becoming a caregiving should have either no effect or a positive effect on their health behaviors. Whereas, financial caregiving does not have the same physical requirements, but can indirectly influence health behaviors when the adult child internalizes the associated costs of aging. Therefore, I hypothesize that the basic needs caregiving should positively effect both the initial and lagged health behaviors, whereas financial caregiving will impact, not initial, but future period health behaviors.

Why health behaviors?

No study to my knowledge has studied the relationship of the adult child caregiver role on health behaviors.[1] I believe these are equally important outcomes to explore along with health outcomes, in particular when studying health in a familial context. Familial studies on health

behaviors within an intergenerational context tend to explore the role of genetic endowments (Gibbison & Johnson, 2007; Birch & Stoddart, 1991). Unfortunately the medical history on the mother is limited, and information related to specific chronic conditions (e.g. lung disease) is not available in the HRS. Therefore, I posit that engagement with one's mother via the caregiving role and intensity of caregiving provided can serve as a proxy for mother's health information, and the rate and exchange of information regarding the aging process.

The primary contribution of this paper is to identity a relatively unexplored behavioral mechanism in the literature individuals use to make current and future healthcare decisions: familial networks, in particular, the transfer of information regarding the aging process from parent-child interactions in later life. Understanding how individuals both receive and process new information regarding the aging process may help in explaining the decisions influencing their own preparations for retirement and old age.

METHOD

Data and Sample

The sample data comes from the Health and Retirement Study (HRS), a nationally representative biannual survey of older Americans that focuses on their health, retirement, and aging lives. The original sample consisted of 51 to 61 year old Americans surveyed in 1992, with an over sample of African and Mexican Americans. The original sample consisted of approximately 12,500 individuals, 7,600 households, and an 82% response rate. To combat sample attrition, the HRS has grown with additional cohorts added in 1998, the Children of the Depression (CODA) and War Babies (WBB), and more recently, the Early Baby Boomers (EBB) in 2004. Also, in 1998, the HRS merged with the Aging and Health Dynamics Survey (AHEAD), a survey of 70 years or older begun in 1993. Important to this study, the survey

consists of extensive questioning and tracking of family networks and interactions. Prior to 1996, the wording for many of the questions of interest in this analysis including, and most importantly, the caregiving question, were different. So for consistency and to hedge against biasing the results, I begin my analysis in 1998, following respondents through 2010. My final dataset is an unbalanced panel (respondents can appear from 2 to 7 waves), which after eliminating respondents with no living mother or maternal figure, those who completed the survey via proxy, are currently residing in a nursing home or assisted living facility, and have non-missing values on the dependent and key independent variables of interest, yields a final maximum sample size of 2,714 men (11,184 person-years) and 4,059 women (20,096 person-years).

Dependent Variables

The dependent variables are grouped into two categories, health indicators and health behaviors. The first health outcome measure, self-assessed health (SAH), is a self-assessed measure in which the respondent answered the following 5-point Likert scale question "Would you say your health is excellent, very good, good, fair, or poor?" coded 1= *excellent*, 2=*very good*, 3=*good*, 4=*fair*, and 5=*poor*. A subjective measure of health status, previous research have found (Ware and Sherbourne 1992) that SAH does a very good job at predicting future mortality; individuals who rate their health excellent/very good tend to live longer on average, than those who indicate fair/poor SAH. For the analysis the variable is dummied to equal one if the respondent selected fair or poor health. The next health outcomes measure is a measure of mental health or depressive symptoms using the Center of Epidemiologic Studies Depression (CESD) scale. The scale is comprised of eight questions, six negative measures (feels depressed, everything's an effort, restless sleep, feels lonely, feels sad, could not get going) and two positive

(feels happy, enjoys life), which are reverse-coded. The eight questions are summed with higher values representing a stronger likelihood of exhibiting depressive symptoms. This is also recoded into a binary variable, with all responses four or greater set equal to one. It is believed that the CESD does an adequate job of determining depression in an individual and therefore, explains the stress the caregiver role places on the adult child (Amirkhanyan & Wolf 2003).

The two healthy behaviors were chosen both for analytical interests and availability within the HRS data. They are also two of the seven Alameda 7 healthy behaviors identified by Belloc and Breslow (1973) as necessary inputs in health production[2], and the HRS has consistent measures for smoking, and vigorous exercise, in all the seven waves. Cigarette smoking is important to study given its association with several negative health conditions, including the increased probability of lung disease and death. It is also a very costly behavior in practice and associated medical costs. Smoking is equal to one if the respondent indicates that they currently smoke. The exercise variable is also coded as binary measure equal to one if the respondent replied in the affirmative to working out or participating in physical exercise at least three times a week. The inverse relationship between cardiovascular disease, coronary heart disease, and physical activity is a common finding in the epidemiology literature. These relationships hold for older age groups, and both men and women (Shiroma & Lee, 2010).

Explanatory Variables

Caregiver Roles and Intensity of Caregiving

The key independent variables are the two caregiver roles. The basic needs caregiver, the time transfer role, is coded as a binary dummy variable equal to one if a respondent answered in the affirmative to the question, “Did you spend a total of 100 hours or more hours since last interview date helping your mother/father with basic personal activities like dressing, eating, and

bathing?" and zero otherwise. Using this question as a proxy for caregiver is common in caregiver studies using the HRS (Coe & vanHoutven, 2009; A & W, 2003; 2006, Johnson & LoSasso, 2000).

The financial caregiver variable is coded as a binary dummy variable equal to one if the respondent replied yes to the question "Not counting any shared housing or shared food, did you give financial help to your mother/father amounting to $500 or more in the last two years?" This caregiver requires essentially no interaction with the parent aside from the time cost of arranging the monetary transfers. In this study, the financial caregiver role represents a less physically, but not necessarily less mentally intensive form of informal caregiving.

In order to create the intensity of caregiving provided, respondents were asked to provide the total number of hours (money given). First they were asked to give a specific number. If they did not enter a specific number, they had to select from a minimum and maximum range of values. The median value is assigned to those respondents who choose to only enter in a range.

Additional Covariates

I rely on three questions asked in all six waves of interests about the parent, basic needs assistance, ability to be left alone, and memory-related disease. Coded as a binary dummy variable, parental health equals one if the respondent answered yes to any one of the following questions: "Does she/he [mother/father] need help with basic personal needs like dressing, eating, and bathing?" or "Has a doctor ever said that your mother suffered from a memory related disease?" and no to "Can she/he [mother/father] be left alone for an hour or more?" The mother's financial state was assessed from two questions. If the respondent either said she owns her home or is in the same or better financial situation.

Additional parental controls include the mother's age, and whether the respondent reports that she is currently married or has a living spouse. This is important to the analysis because the caregiver burden usually falls on the spouse first if the elderly/disabled person is married and then to the person's children (Lima et al, 2008). I include a control for whether the mother is living in the respondent's home. Several studies exist on the power dynamic and cost savings of having an elderly parent move into one's residence as opposed to placing them in a formal care facility. This would be the case if, for example, the parent was mentally or physically disabled or suffered from a large number of ADLs (McGarry, 1998). There may exist, however, a large number of reasons why a respondent could move a parent into their home, such as free or cheap child care to grandchildren.

Remaining covariates are consists of the adult child's age, the number of living children and siblings, and whether the respondent indicates working full-time. Time spent assisting an aging parent significantly reduces time both male and female workers invest in the labor market (Johnson & LoSasso, 2000). Also, there are controls for whether the adult child has any health insurance (e.g. public, private, employer-provided) and a continuous logged measure for household wealth. All regressions are run separately by gender, as women are more likely to take on the caregiver role given their kin-keeper and care provider in traditional society (Sarkisian & Gerstel, 2004; Moen, Robison, & Dempster-McClain, 1995), and by current marital status with individuals in married or partnered relationships grouped together. Married households have two adults that can potentially share in the household and caregiver duties (Coe & Van Houtven, 2009; Stoller, 1983). All time invariant measures are not included in the final regressions as they get dropped as result of the fixed effects regression (discussed below).

However, I do include respondent's educational attainment, race, nativity, and religion in the descriptive statistics table.

Conceptual Framework and Estimation Strategy

The theory behind the current analysis is derived from Grossman's health production function (1972) based within the framework of Becker's (1965) household production model, in which individuals invests their inputs in the household technology to determine levels of labor supply, health, fertility, household arrangements, etc. The health production function deviates only slightly from the Becker model in that now the individual combines market and non-market inputs in conjunction with their household production function to yield output, good health. An individual's production function is determined in my model by caregiver status, extent of parental needs, health insurance status, age, and labor market and household characteristics that are also correlated with the depreciation of health stock over time. Individuals maximize their utility functions subject to both money and time constraints. In addition to the health outcomes, I also examine whether caregiving influences health behaviors.

To estimate the relationship between the caregiver roles, health, and healthy behaviors I estimate a multivariate linear regression model to examine trends in health status and health behaviors before and after adult children assume the caregiver role. With the use of panel level data, I am able to use individual respondents as their own control with the inclusion of individual fixed effects. Additionally, because respondents are experiencing transitions into caregiving at different times over the course of the ten year period, I include time fixed effects to remove any variation resulting from new cohorts being rolled into the sample as a feature of the study design. The regression model for assessing the initial effect of caregiving is of the form:

$$Y_{it} = \beta_1 + \propto_i + \delta_t + \beta_2\, bsccgvr_{it} + \beta_3\, fincgvr_{it} + PXit + \gamma\, X_{it} + \varepsilon_{it} \qquad (1)$$

Where Y_{it} represents the health outcome or healthy behavior of individual i=1,…,N in year t=1,…T, δ_t is the control for each year, $cgvrstat_{it}$ is caregiver status (basic, financial, or both) in year t, PX_{it} are the parental characteristics, X_{it}, are the respondent's characteristics including the health stock measure, and ε_{it} is the error term. Lastly, $\propto_i$ is an indicator for each individual in the sample, and controls for unique differences between people. It will be the sign and point estimate on the caregiver role, β_1, of most interest in this study.

I conclude with examining if there is lagged impact of caregiving on the dependent variables is similar to (1), except health in the current period is regressed on a lagged caregiver measure, $\beta_5\ bsccgvr_{it-1}$ and $\beta_6\ fincgvr_{it-1}$ for two years later (the following survey wave)[3].

$$Y_{it} = \beta_4 + \propto_i + \delta_t + \beta_5\ bsccgvr_{it-1} + \beta_6\ fincgvr_{it-1} + PXit + \gamma\ X_{it} + \varepsilon_{it} \qquad (2)$$

This model tests lagged effect having been a (money/time) caregiver in time *t-1*. The coefficient estimates on the lagged caregiver variables in models (2), β_5 and β_6, will capture this unintended spillover effect of health information in the future.

Reverse Causality Concerns

Even though fixed effects regression models control for unobserved heterogeneity within individuals, it cannot address the potential problem of reserve casuality, adult children select into caregiving because of their health. The hypothesis that caregiving is actually positively related to health outcomes has previously been proposed in the literature as the healthy caregiver hypothesis model (HCH) (Fredman et al., 2008). In order to address this issue, I also run all models on a restricted sample of respondents who indicate that they did not experience any chronic health conditions or health limitations prior to caregiving. Healthy sample regression estimates are presented alongside all full sample estimates for comparison.

RESULTS

Descriptive Statistics

Examining the caregiver roles by sex and marital status in Figure 1 reveals that within this sample, married (9.8%) and unmarried (12%) women are far more likely to be basic needs caregivers than men (7% and 4.9%), and unmarried women more so than married. Married men are the least likely to be a basic needs caregiver to an aging mother. The opposite is true when it comes to the financial caregiver role with unmarried (15.9%) and married men (11.6%) leading this group, and married women (11.2) being the least likely to report being a financial caregiver. We can also see from the chart, that there is increased chance of being a financial caregiver amongst adult children who already report being a basic needs caregiver, in particular for unmarried men, with close to 46% of basic needs caregivers self-reporting that they also provide financial assistance. The opposite relationship is not as pronounced with financial caregivers providing on average between 20 to 28% of basic needs care in the female sample, and 12 to 21% in the men's sample.

[Figure 1 about here]

Table 1 presents additional descriptive statistics of our caregiver samples, including sample means on the caregiver intensity variables. Not surprisingly, unmarried adult children provide more hours of basic needs assistance on average per study period than married children, and unmarried women (662 hours) more than unmarried men (507 hours). There are more unmarried male basic needs caregivers who also provide financial assistance compared to married men and unmarried women, yet no significant difference in the amount of financial assistance provide by marital status or between men and women. Among financial caregivers,

there are no statistically significant differences in the amount of financial assistance provided for women. Married male caregivers do give more at the upper tail of the distribution than women.

[Table 1 about here]

Table 2 lists the descriptive statistics for the total sample data and by caregiver status. In general, non-caregivers are in better health than both basic needs and financial caregivers in the subjective health measures, reporting higher self-assessed health scores and score lower on the CES-D scale. The distribution of the CESD score index is heavily skewed, with most respondents reporting zero or at most one depressive symptom. On average, non-basic needs caregivers exercise more often than caregivers, and financial caregivers exercise more than those who do not provide financial assistance. They also smoke less compared to basic needs caregivers and non-caregivers. Less than one quarter of the respondents in the sample currently smoke; however, close to 40 percent of the individuals in each group report exercising more than three times a week. The basic descriptive data suggests that basic needs caregivers are in poorer health, and the financial caregivers practice positive health behaviors.

[Table 2 about here]

The mothers of the basic needs caregivers are more likely to have ADLs and are slightly older, with the average age in the mid eighties. Most of the sample report that their mother's financial situation is either as good as or better than their own or that she owns her home. When delineated by caregiver type, however, non-caregiver averages are higher in both groups. The majority of the mothers have completed as least a high school degree across all caregiver groups; less than a fifth of the sample indicate that their mother is currently married.

Women, in general, are over represented in the sample, comprising close to sixty percent, and over two-thirds of the total sample is married. The sample is mostly white, 81%, and 8%

black, 7% Hispanic, and 2.4% are classified as non-Hispanic other. Close to nine percent of the sample is foreign born and over 75% have at least a high school degree. Financial caregivers are more likely to be employed full-time and have higher average net wealth than non-caregivers. In general, financial caregivers appear to be the most economically and socially advantaged, while the basic needs caregivers are in poorer health.

Initial Effects of Informal Caregiving and Caregiving Intensity on Health Outcomes

Tables 3 list the coefficient estimates for model (1). Panel A includes the binary caregiver results and Panel B the intensity of caregiving regression output. Conditional on all covariates (listed in Appendix A), we see that basic needs caregiving negatively impacts the health of unmarried women, and it also increases their chances of being diagnosed with depressive symptoms. When the sample is restricted to the healthy sample pre-caregiving, the relationships are no longer significant. This same relationship is evident for unmarried male basic needs caregivers. In the full sample the relationship is statistically significant, but is no longer once unhealthy men pre-caregiving are removed from the sample.

Turning to the financial caregiver results, among the sample that was healthy at outset, unmarried women who provide financial caregiving demonstrate higher levels of depression. Whereas married men who become a financial caregiver are less likely to report poor health. In the healthy sample, however, the effect is not significant. Results suggest that at initial onset of informal basic needs and financial caregiving, unmarried women who are basic needs caregivers exhibit negative health outcomes. Comparatively, the relationship between male caregiver types and health outcomes is weaker.

The fact that all the significant relationships no longer exists in the healthy sample does provide additional evidence that there may be selection into the caregiver role based on one's

health, in particular among unmarried adult children. This findings supports both theoretical and empirical research that finds adult children with the fewest time constraints and in poorer health (contrary to the HCH model), have a higher probability of informal caregiving.

[Table 3 about here]

The intensity of basic needs caregiving provided, as measured by the number of hours spent providing assistance, is found to negatively impact the health of unmarried women and increase depressive symptoms of both unmarried women and men. In the healthy sample, the intensity of basic needs assistance positively impacts reporting poor health for married men. None of the effects of financial assistance and health outcomes are significant, with the exception of the married women in the healthy sample, for who is it increases the chance of reporting depressive symptoms. This suggests that there may be potential psychological effects of financially supporting your mother in the initial period.

Initial Effects of Informal Caregiving and Caregiving Intensity on Health Behaviors

The next set of results presented in Table 4 examines the relationship of informal caregiver type on vigorous exercise and smoking behavior. The estimates indicates that the initial effect of informal caregiving, both basic needs and financial, on health behaviors are weak. Basic needs caregiving increases engagement in a positive health behavior, vigorous exercise, for married and unmarried men in the full sample and both married and unmarried women in the restricted healthy sample. There is a positive effect on smoking, a negative health behavior, for married male basic needs caregivers, which remains significant in both sample specifications.

[Table 4 about here]

As hypothesized there are no initial effects of financial caregiving or the amount of financial assistance on either positive or negative health behaviors for women, and a weakly

positive effect of exercise for unmarried men. The amount of assistance provided also effects engagement in health behaviors, with a positive relationship between hours of basic needs assistance provided and exercising for married women and men. And similar to becoming a basic needs caregiver, the number of basic needs hours is positively related to engaging in smoking behavior among married men.

Lagged Effects of Informal Caregiving and Caregiving Intensity on Health Outcomes and Health Behaviors

I turn now to my final analyses to assess whether the impact of basic needs or financial caregiving manifest into the next period. Table 5 lists the coefficient estimates for the caregiver variables testing model (2) for both the health outcomes and health behaviors. Being a basic needs caregiver does have some residual effects on health outcomes for married men two years out, with an increase in depressive symptoms. Married women basic needs caregivers in the healthy sample also are more likely to smoke. The lagged effect of intensity of basic needs caregiving does not have any significant relationship with health outcomes or health behaviors, with the exception of unmarried women in the healthy sample who have an increased probability of smoking at least two years out.

[Table 5 about here]

Comparatively, being a financial caregiver has more significant effects on health in the lagged models than basic needs caregiving. Unmarried men and women experience an increase in depression by becoming an informal financial caregiver, and married men exercise more. These very same relationships also correspond to the amount of financial assistance provided, listed in Panel B of Table 5. The amount of financial assistance provided increases the likelihood of unmarried men reporting depressive symptoms and decreases the chances unmarried women

report poor health. These findings suggest that the monetary toll of caregiving can influence adult children's health outcomes, in particular those not currently in a marital union.

DISCUSSION

The decision to provide assistance to aging parents is the subject of a large literature that cuts across disciplines, as is the psychological, social, and physical health outcomes of those participating in this relationship dynamic. I hypothesized that the type and intensity of caregiving would impact health behaviors in addition to health outcomes not only in the present period, but also in future periods. The results from the study suggest depressive symptoms increase among unmarried basic needs caregivers, but that they may be selecting into that role because of their poor health. Married women who assume a caregiving role for an elderly mother experience an increased probability of smoking over time. While for unmarried men becoming a financial caregiver elevates their likelihood of exhibiting depressive symptoms. The fact that I find differences by marital status may suggest that marriage provide a buffer to caregiver stress and poor health outcomes for adult children.

It is my belief that the primary contribution of this paper is to identity a relatively unexplored behavioral mechanism in the literature that individuals use to make current and future healthcare decisions, familial networks, and in particular, the transfer of information regarding the aging process from parent-child interactions in later life. Not only is the caregiver role an onerous one, but it takes on many forms, and contributes to the exchange of information from both parent to child and child to parent. How individuals use information, in particular, family health information remains understudied. Previous studies suggest that adult child caregivers do make conscious decisions between providing care to an elderly parent and the type of care provided and these decisions are influenced by familial and labor market, and potential

health-related considerations. The findings from this analysis, when the full sample results were compared with the healthy sample also support this research. Therefore, the type of caregiver role assumed could be driving the differential health and behavioral outcomes in this study. While fixed effects modeling will reduce the potential bias introduced by changes an individual's familial, labor, or previous health status over time, it wouldn't be able to account for the caregiver role selection. Future research should examine the selection into the type of caregiver roles and its effect on health outcomes and health behaviors.

My study is not without limitations. The first concerns the timing of the caregiving episode. Model (1) claims to capture an initial effect of caregiving, however, the survey question asks about a two-year period prior to the interview. The estimation techniques may not picking up immediate effects due to the biannual nature of the dataset, and the lagged effect model (2), could be upwards of four years since initial caregiving begin. Second, my analysis summarizes intensity of caregiving provided, rather than an assessment of continuous caregiving. There is evidence to suggest that duration of caregiving matters for health outcomes (Coe & van Houtven, 2009; Bertrand et al., 2012), and should be analyzed in future studies.

My study suggest that the effects of caregiving not only manifest from assisting an elderly parent with ADLs, but can also weigh on children due to the potential unintended costs of taking on the role of financial caregiver. There have been recent calls for American policy makers to discuss assisting American families with the costs of elder care (Swartz, 2011), however, it runs counter to societal belief that there is less need for financial assistance given the existence of Medicaid, which already covers long-term expenditures for the elderly. It is my hope that future research will be more sensitive to the role of financial caregiving and it roles on the caregiver's health and health behaviors. The changing age structure of American society,

coupled with time and monetary constraints placed on American households, will definitely make studying familial caregiving an important area of study for the foreseeable future.

REFERENCES

Amirkhanyan, A. & D. Wolf. (2003). “Caregiver Stress and Noncaregiver Stress: Exploring the Pathways of Psychiatric Morbidity.” *The Gerontologist*. 43(6): 817-827

Amirkhanyan, A. & D. Wolf. (2006).“Parent Care and the Stress Process: Findings from Panel Data” *Journal of Gerontology: Social Sciences*. 61B(5): S248-S255.

Arno, P.S., Levine, C., & M.M. Memmott.(1999) The Economic Value of Informal Caregiving. *Health Affairs*. 18(2), 182-188.

Becker, G. S. (1965). “A theory of the allocation of time." *Economic Journal.* 75: 493-517.

Belloc, N.B. & L. Breslow. (1972). “Relationship of physical health status and health practices.” *Preventive Medicine* 409-421.

Bernheim, B. Douglas, A. Shleifer, & L. H. Summers. 1985. “The Strategic Bequest Motive”. *The Journal of Political Economy*. 93(6): 1045-1076.

Bertrand, R.M., Saczynski, J. S., Mezzacappa, C., Hulse, M, Ensrud, K, & L. Fredman. (2012). Caregiving and cognitive function in older women: evidence for the healthy caregiver hypothesis. Journal of Aging and Health. 24(1):48-66.

Birch, S. and Stoddart, G. (1989). Incentives to be healthy: an economic model of health-related behaviour. http://www.chepa.org/Files/Working%20Papers/24.pdf

Bobinac, A., van Exel, N. Job A., Rutten, Frans F. H., Brouwer, Werner B. F. (2010). Caring for and Caring About: Disentangling the Caregiver Effect and the Family Effect. *Journal of Health Economics*. 29: 549-56.

Burton, L. C., Newsom, J. T., Schulz, R., Hirsch, C. H., & P.S. German. (1997). Preventive Health Behaviors among Spousal Caregivers". *Preventive Medicine*. 26: 162-169.

Caputo, Richard K. (2002). Adult Daughters as Parental Caregivers: Rational Actors versus Rational Agents. *Journal of Family and Economic Issues*, 23(1): 27-50.

Chang, C. F. & S. I. White-Means. (1995). Labour supply of informal caregivers. *International Review of Applied Economics*. 9(2), 192-205.

Coe, N. B., & C. H. vanHoutven. (2009). Caring for mom and neglecting yourself? The health effects of caring for an elderly parent. *Health Economics*. 18: 991-1010.

Congressional Budget Office. (2004). Financing Long-Term Care for the Elderly. Washington D.C.

Couch, K. A., Day, M. C., & D. A. Wolf. (1999). Time? Money? Both? The Allocation of resources to older parents. *Demography*. 36, 2, 219-232.

Ettner, S. (1996). The opportunity costs of elder care. *The Journal of Human Resources*. 3191: 189-205.

Gibbison, G. A. & C. D. Johnson. (2007). Family history of chronic disease and participation in healthy behaviors. *Health Economics, Policy and Law*. 2:297-315.

Grossman, M. (1972). On the concept of health capital and the demand for health. *The Journal of Political Economy*. 80(2), 223-255.

Hickenbottom, S. L., Fendrick, A. M., Kutcher, J.S., Kabeto, M. U., Katz, S. J., K. M. Langa. (2002). A national study of the quantity and cost of informal caregiving for the elderly with stroke.

Kniesner, T. J., & A.T. LoSasso. (2001). Intergenerational Labor market and Welfare

Consequences of Poor Health. In *Worker wellbeing in a changing labor market.* Ed. By S.W. Polachek. Oxford: Emerald Group.

Johnson, R. W. & A. T. Lo Sasso. (2000). "The Trade-Off between Hours of Paid Employment and Time Assistance to Elderly Parents at Midlife". The Urban Institute.

Lee, J.A., Walker, M., & Shoup, R. (2001). Balancing Elder Care Responsibilities and Work: The Impact on emotional health. *Journal of Business and Psychology*. 16(2), 277-289.

Lima, J. C., Allen, S., Goldscheider, F., & O. Intrator. (2008). "Spousal Caregiving in Late Midlife Versus Older Ages: Implications of Work and Family Obligations." The Journals of Gerontology Series B: Psychological Sciences and Social Sciences. 63:S229-S238.

Lubitz, J., Liming C., Ellen K., and H. Lentzner. (2003). "Health, life expectancy, and health care spending among the elderly". *The New England Journal of Medicine*. 349:1048.

McGarry, K. (1998). "Caring for the Elderly: The Role of Adult Children" Inquiries in the Economics of Aging by David Wise, Chapter 5. Chicago: University of Chicago Press, 133-166.

Moen, P., J. Robison, & D. Dempster-McClain. (1995). Caregiving and women's well-being: A Life-Course Approach." *Journal of Health and Social Behavior*. 36(3): 259-273.

Ory, M. G., Hoffman, R. R., Yee, J.L., Tennstedt, S., & R. Schulz. (1999) Prevalence and impact of caregiving: A detailed comparison between dementia and nondementia caregivers. *The Gerontologist*, 39(2), 177-186.

Pavalko, E. K. & S. Woodbury. (2000). "Social Roles as Process: Caregiver Career's and Women's Health." *Journal of Health and Social Behavior*, 41(1): 91-105.

Pezzin, L. & B. S. Shone. (1997). "The Allocation of Resources in Intergenerational Households: Adult Children and Their Elderly Parents". The American Economic Review.87: 460-64.

Pezzin, L. & B. S. Shone. (1999). “Intergenerational Household Formation, Female Labor Supply and Informal Caregiving: A Bargaining Approach”. Journal of Human Resources. 34(3): 475-503.

Pinquart, M. & S. Sorensen. (2007). Correlates of Physical Health of Informal Caregivers: A Meta-Analysis.” *Journal of Gerontology Psychological Sciences*. 62B, 2, P126-P137.

Pinquart, M. & S. Sorensen. (2004). “Differences Between Caregivers and Noncaregivers in Psychological Health and Physical Health: A Meta-Analysis”. Psychology and Aging. 18(2):250-267.

Pillemer, K., & J.J. Suitor. (2006) Making Choices: A within-family study of caregiver selection. *The Gerontologist.*46(4): 439-448.

Preston, S. (1984). "Children and the Elderly: Divergent Paths for America's Dependents," *Demography* 21: 435-452.

Sarkisian, N. & N. Gerstel. (2004). Explaining the Gender Gap in Help to Parents: The Importance of Employment”. *Journal of Marriage and Family*. 66:2, 431-151.

Schnoll, R.A., M. Malstrom, C. James, et al. (2002). Correlates of tobacco use among smokers and recent quitters diagnosed with cancer. *Patient Education and Counseling*. 46(2): 137-145.

Schulz, R., & S.R. Beach. (1999) Caregiving as a risk factor for mortality. *JAMA: Journal of the American Medical Association*, 282(23): 2215-2219.

Shiroma, E. J., & I. Lee. (2010). Physical Activity and Cardiovascular Health: Lessons learned from Epidemiological Studies Across Age, Gender, and Race/Ethnicity. *Circulation*. 122: 743-752.

Sloan, F.A., Picone, G. & T. J. Hoerger. (1997) The supply of children’s time to disabled elderly

parents. *Economic Inquiry*. 35, 295-308.

Sloan, F. A., Zhang, H. H., J. Wang. (2002). "Upstream Intergenerational Transfers". *Southern Economic Journal*. 69: 363-380.

Spillman, B. C., & L. E. Pezzin. (2002) Potential and active family caregivers: Changing networks and the 'sandwich generation'. *Milbank Quarterly*. 78(3): 347-374.

Stoller, E.P. (1983) Parental caregiving by adult children. *Journal of Marriage and the Family*. 45(4), 851-858.

Stone, R., G. L. Cafferata, & J. Sangl. (1987). Caregivers of the Frail Elderly: A National Profile." *The Gerontologist*. 25, 616-626.

Swartz, K. (2011). Sharing the Financial Responsibility of Caring for Parents. *The Journal of the American Medical Association*. 307(14): 1408a-1542.

Szinovacz, M. E., & A. Davey. (2007). Changes in Adult Child Caregiver Networks. *The Gerontologist*, 47(3): 280-295.

Van Houtven, C. & E. Norton. (2007). "Informal care and Medicare expenditures: testing for heterogeneous treatment effects". *Journal of Health Economics*. 27(1):134-156.

Vitaliano, P.P., J. Zhang, & J.M. Scanlan. (2003). Is caregiving hazardous to one's physical health? A Meta-Analysis. *Psychological Bulletin*. 126:946-972.

Wakabayashi, C. & K. M. Donato. (2005) The consequences of caregiving: Effects on women's employment and earnings. *Population Research and Policy Review*. 24(5): 467-488.

Ware, J.E. & C.D. Sherbourne. (1992). "The MOS 36-Item Short-Form Health Survey (SF-36): I. Conceptual Framework and Item Selection. *Medicare Care*. 30(6):473-483.

White-Means, S. & C. Chang. (1991). "Family Choices with Managed Care for the Home Bound Elderly" *Southern Economic Journal*. 58(1): 203-224.

Wolff, J. L. & J. D. Kasper. (2006) Caregivers of frail elders: Updating a national profile. *The Gerontologist*. 46(3): 344-356.

Yee, J. L., & R. Schulz (2000) Gender differences in psychiatric morbidity among family caregivers. *The Gerontologist*, 40(2): 147-164.

Zhu, C. W, Moore, M., & E. Clipp. (2003). "Dementia Problem Behavior and the Production of Informal Caregiving Services". *Review of Economics of the Household*. 1(1-2): 59-7

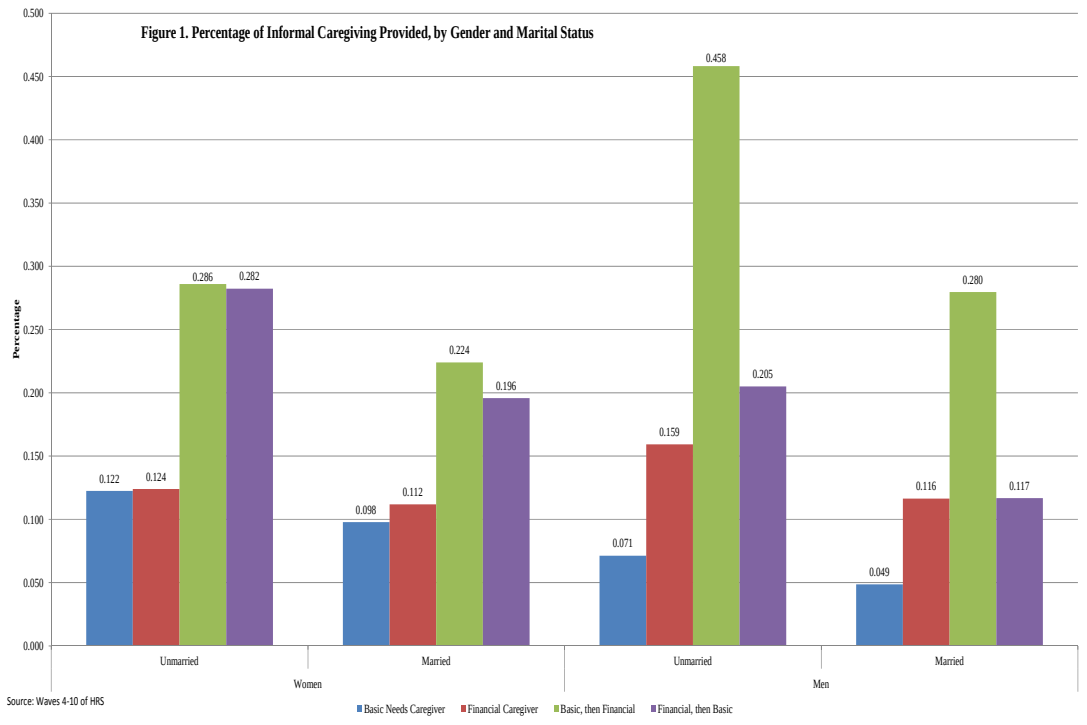


Table 1. Sample Descriptives on Caregiver Type and Intensity of Caregiving Among Only Caregivers

	Women					Men				
	Unmarried			Married		Unmarried			Married	
	Mean	Std. Dev.		Mean	Std. Dev.	Mean	Std. Dev.		Mean	Std. Dev.
Basic Needs Caregivers:										
Total Hours of Basic Needs Caregiving	661.832	1263.709	*	518.863	835.666	506.808	757.595	*	380.952	603.919
Basic Needs Hours: less than 200	0.188	0.391		0.213	0.410	0.164	0.372	*	0.369	0.483
Basic Needs Hours: 200 to less than 500	0.353	0.478		0.359	0.480	0.338	0.475	*	0.276	0.447
Basic Needs Hours: More than 500	0.459	0.499	*	0.428	0.495	0.498	0.502	*	0.355	0.479
Provides financial assistance to mother	0.286	0.452		0.224	0.417	0.458	0.500	*	0.280	0.449
Total Amount of Financial Assistance given	3,696	5,823		5,726	12,175	3,682	3,488		3,989	6,234
Financial Aid: None	0.714	0.452	*	0.776	0.417	0.542	0.500	*	0.720	0.449
Financial Aid: less than $1000	0.070	0.256		0.053	0.224	0.107	0.310		0.050	0.219
Financial Aid: $1000 to less than $5000	0.120	0.325		0.099	0.299	0.177	0.383	*	0.141	0.348
Financial Aid: More than $5000	0.096	0.295		0.072	0.258	0.174	0.381	*	0.089	0.284
Financial Caregivers:										
Total Amount of Financial Assistance given	3,500	11,443		3,520	7,412	4,035	11,942		3,599	5,944
Financial Aid: less than $1000	0.289	0.454		0.281	0.450	0.227	0.419		0.226	0.418
Financial Aid: $1000 to less than $5000	0.466	0.499		0.508	0.500	0.481	0.500	*	0.526	0.500
Financial Aid: More than $5000	0.245	0.430		0.211	0.408	0.292	0.455	*	0.248	0.432
Provides basic needs assistance to mother	0.282	0.450		0.196	0.397	0.205	0.404	*	0.117	0.321
Total Hours of Basic Needs Caregiving	658.326	1325.870	*	458.772	758.793	342.559	217.784	*	417.972	626.875
Basic Needs Hours: None	0.718	0.450	*	0.804	0.397	0.795	0.404	*	0.883	0.321
Basic Needs Hours: less than 200	0.043	0.203		0.035	0.184	0.021	0.144	*	0.033	0.179
Basic Needs Hours: 200 to less than 500	0.085	0.280		0.069	0.254	0.076	0.265	*	0.029	0.167
Basic Needs Hours: More than 500	0.154	0.361	*	0.092	0.289	0.108	0.311	*	0.055	0.228

Note: Data are from HRS, 1998-2010; Weighted Sample Means; Dollar amount in $2008; * denotes significant difference within sex between unmarried and married is statistically significant at the 5% level; underlining denotes difference within marital status between women and men at 5% level

Table 2. Descriptive Statistics of Dependent Variables, Model Covariates, Mother and Respondent Characteristics, by Caregiver Status

	Total		Basic Needs		Non-Basic Needs			Financial Caregiver		Non-Financial		
Variable Description	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.		Mean	Std. Dev.	Mean	Std. Dev.	
Health Outcomes and Health Behaviors												
In fair/poor health	0.203	0.402	0.230	0.421	0.188	0.391	***	0.213	0.410	0.196	0.397	***
Depressed (CESD>4)	0.376	0.624	0.440	0.660	0.346	0.603	***	0.406	0.641	0.362	0.615	***
Vigorous Activity	0.350	0.477	0.340	0.474	0.356	0.479	**	0.360	0.480	0.347	0.476	***
Current Smoker	0.172	0.377	0.181	0.385	0.170	0.376		0.171	0.376	0.175	0.380	
Mother's Characteristics												
Mother requires basic needs assistance, can't be left alone, or has memory related disease	0.197	0.398	0.314	0.464	0.149	0.356	***	0.233	0.423	0.187	0.390	***
Mother own home or is in a better financial situation than respondent	0.702	0.457	0.656	0.475	0.723	0.447	***	0.617	0.486	0.742	0.438	***
Mother lives with respondent	0.046	0.209	0.085	0.279	0.029	0.167	***	0.084	0.277	0.030	0.170	***
Mother married	0.187	0.390	0.126	0.332	0.220	0.414	***	0.149	0.356	0.209	0.407	***
Mother has at least high school degree	0.860	0.347	0.839	0.367	0.872	0.334	***	0.836	0.370	0.873	0.333	***
Mother's age	83.281	7.214	84.917	6.673	82.643	7.037	***	83.487	6.781	83.309	7.102	*
Respondent's Characteristics												
Female	0.565	0.496	0.718	0.450	0.505	0.500	***	0.558	0.497	0.579	0.494	***
Currently married	0.714	0.452	0.667	0.471	0.730	0.444	***	0.682	0.466	0.723	0.448	***
Age	60.134	6.477	60.908	6.583	59.553	6.185	***	59.794	6.219	60.068	6.399	**
Has health insurance	0.760	0.427	0.752	0.432	0.760	0.427	*	0.766	0.424	0.754	0.431	*
Total number of children in household	2.856	1.900	2.846	1.971	2.842	1.864		2.773	1.889	2.874	1.902	**
Total number of living siblings	2.875	2.289	2.719	2.247	2.944	2.301	***	3.005	2.374	2.813	2.243	***
Net Wealth	636,261	2,401,562	595,560	2,111,734	652,765	2,543,313		747,058	3,054,873	584,040	2,061,024	***
Fulltime employed	0.441	0.497	0.358	0.480	0.487	0.500	***	0.457	0.498	0.441	0.496	***
Northeast Census Region	0.150	0.357	0.148	0.356	0.149	0.356		0.171	0.376	0.139	0.346	***
Midwest Census Region	0.261	0.439	0.231	0.421	0.276	0.447	***	0.209	0.407	0.285	0.451	***
Southern Census Region	0.382	0.486	0.425	0.494	0.362	0.481	***	0.400	0.490	0.374	0.484	***
West Census Region	0.206	0.405	0.195	0.396	0.212	0.409	***	0.219	0.414	0.201	0.401	
Other Region	0.001	0.026	0.001	0.034	0.001	0.022	***	0.001	0.027	0.001	0.026	**
Additional Characteristics (Time Invariant/Not included in Model)												
Less than high school	0.159	0.366	0.170	0.376	0.153	0.360	*	0.150	0.357	0.162	0.369	***
High school	0.288	0.453	0.300	0.458	0.282	0.450	***	0.260	0.439	0.300	0.458	***
Some college	0.269	0.444	0.282	0.450	0.266	0.442		0.278	0.448	0.268	0.443	***
Bachelors or more	0.283	0.450	0.248	0.432	0.299	0.458	***	0.312	0.463	0.269	0.444	***
non-Hispanic Black	0.087	0.281	0.106	0.308	0.078	0.269	***	0.132	0.339	0.067	0.250	***
non-Hispanic White	0.817	0.387	0.790	0.407	0.829	0.376	***	0.734	0.442	0.854	0.353	***
non-Hispanic Other	0.024	0.154	0.036	0.187	0.018	0.133	***	0.038	0.190	0.018	0.132	***
Hispanic	0.072	0.258	0.067	0.250	0.074	0.262	***	0.096	0.295	0.061	0.239	***
Foreign born	0.088	0.284	0.073	0.261	0.093	0.291	***	0.131	0.338	0.067	0.250	***
No religion	0.090	0.287	0.067	0.251	0.102	0.302	***	0.080	0.271	0.096	0.295	***
Observations	27,054		9,120		17,219			8,403		17,936		

Note: Data are from the Health and Retirement Study (HRS) waves 3-10; Number of observations listed are the maximum number, given that for a few variables there are missing values. Asterisks denotes difference in caregiver and non-caregiver group is statistically significant: *** at .1%, ** at 1%, and *** at 5%

Table 3. The effect of caregiver type and intensity of caregiving on health outcomes from fixed effects regression models

	Women				Men			
	Full Sample		Healthy Sample		Full Sample		Healthy Sample	
	Married	Unmarried	Married	Unmarried	Married	Unmarried	Married	Unmarried
Panel A. Caregiver Type								
Fair/Poor Health								
Basic Needs Caregiver	-0.009	0.060***	0.008	0.038	0.023	0.039	0.050	0.021
	[0.012]	[0.021]	[0.018]	[0.036]	[0.022]	[0.046]	[0.033]	[0.078]
Financial Caregiver	-0.002	0.000	0.003	-0.012	-0.029*	-0.020	-0.028	0.045
	[0.012]	[0.023]	[0.016]	[0.028]	[0.017]	[0.033]	[0.024]	[0.035]
Depression (CESD>4)								
Basic Needs Caregiver	0.028	0.057*	0.011	0.067	0.030	0.159**	-0.008	0.113
	[0.022]	[0.034]	[0.033]	[0.069]	[0.028]	[0.077]	[0.048]	[0.114]
Financial Caregiver	0.032	0.013	0.056*	0.005	0.002	-0.049	0.047	-0.059
	[0.023]	[0.035]	[0.031]	[0.063]	[0.022]	[0.058]	[0.038]	[0.090]
Panel B. Intensity of Caregiving								
Fair/Poor Health								
Hours of basic needs assistance provided (logged)	0.000	0.011***	0.001	0.007	0.004	0.007	0.011*	0.005
	[0.002]	[0.004]	[0.003]	[0.006]	[0.004]	[0.008]	[0.006]	[0.014]
Amount of financial assistance provided (logged)	-0.001	0.000	0.001	0.000	-0.003	-0.003	-0.003	0.006
	[0.002]	[0.003]	[0.002]	[0.004]	[0.002]	[0.005]	[0.003]	[0.005]
Depression (CESD>4)								
Hours of basic needs assistance provided (logged)	0.005	0.010*	0.002	0.008	0.006	0.027**	-0.001	0.004
	[0.004]	[0.006]	[0.006]	[0.013]	[0.005]	[0.013]	[0.008]	[0.017]
Amount of financial assistance provided (logged)	0.004	-0.001	0.008*	-0.003	0.001	-0.006	0.007	0.001
	[0.003]	[0.005]	[0.004]	[0.008]	[0.003]	[0.008]	[0.005]	[0.012]

Note: Data are from waves 4-10 of the HRS, Robust Standard errors in brackets. All specifications inclues the same covariates listed in Appendix 1; *** p<0.01, ** p<0.05, * p<0.10. Cell coefficients represent the marginal effect of caregiver type (caregiver intensity) on the given health outcome.

Table 4. The effect of caregiver type and intensity of caregiving on health behaviors from fixed effects regression models

	Women				Men			
	Full Sample		Healthy Sample		Full Sample		Healthy Sample	
	Married	Unmarried	Married	Unmarried	Married	Unmarried	Married	Unmarried
Panel A. Caregiver Type								
Vigorous Exercise								
Basic Needs Caregiver	0.013	0.053**	0.058*	0.099*	0.059**	0.116*	0.021	0.158
	[0.018]	[0.025]	[0.031]	[0.051]	[0.028]	[0.065]	[0.053]	[0.103]
Financial Caregiver	0.017	0.010	-0.001	0.003	0.014	-0.078*	-0.014	-0.077
	[0.018]	[0.026]	[0.030]	[0.052]	[0.023]	[0.041]	[0.042]	[0.074]
Current Smoker								
Basic Needs Caregiver	0.005	-0.004	0.004	-0.002	0.040***	0.011	0.080**	0.065
	[0.007]	[0.014]	[0.013]	[0.023]	[0.015]	[0.037]	[0.032]	[0.076]
Financial Caregiver	0.001	-0.004	0.013	-0.015	0.010	0.005	0.016	0.010
	[0.008]	[0.016]	[0.010]	[0.024]	[0.009]	[0.018]	[0.018]	[0.038]
Panel B. Intensity of Caregiving								
Vigorous Exercise								
Hours of basic needs assistance provided (logged)	0.001	0.005	0.010*	0.012	0.010*	0.015	-0.001	0.021
	[0.003]	[0.004]	[0.006]	[0.009]	[0.005]	[0.011]	[0.009]	[0.017]
Amount of financial assistance provided (logged)	0.002	0.001	-0.001	0.001	0.001	-0.012**	-0.003	-0.012
	[0.003]	[0.003]	[0.004]	[0.006]	[0.003]	[0.006]	[0.006]	[0.015]
Current Smoker								
Hours of basic needs assistance provided (logged)	0.000	0.000	0.000	-0.001	0.008***	0.001	0.015***	0.008
	[0.001]	[0.002]	[0.002]	[0.004]	[0.003]	[0.006]	[0.006]	[0.011]
Amount of financial assistance provided (logged)	0.001	-0.001	0.002	-0.003	0.001	0.001	0.002	0.002
	[0.001]	[0.002]	[0.001]	[0.004]	[0.001]	[0.002]	[0.002]	[0.005]

Note: Data are from waves 4-10 of the HRS, Robust Standard errors in brackets. All specifications inclues the same covariates listed in Appendix A; *** p<0.01, ** p<0.05, * p<0.10. Cell coefficients represent the marginal effect of caregiver type (caregiver intensity) on the given health behavior.

Table 5. Fixed Effects Regression Estimates of Lagged Caregiver on Health Outcomes and Health Behaviors

	Women				Men			
	Full Sample		Healthy Sample		Full Sample		Healthy Sample	
	Married	Unmarried	Married	Unmarried	Married	Unmarried	Married	Unmarried
Panel A. Caregiver Type								
Fair/Poor Health								
Basic Needs Caregiver	-0.006	-0.010	0.007	0.030	0.002	-0.075	0.058	-0.126
	[0.013]	[0.021]	[0.017]	[0.038]	[0.023]	[0.056]	[0.042]	[0.094]
Financial Caregiver	0.008	0.026	0.002	0.053	0.018	0.001	0.035	0.015
	[0.013]	[0.024]	[0.016]	[0.042]	[0.017]	[0.036]	[0.025]	[0.063]
Depression (CESD>4)								
Basic Needs Caregiver	0.022	-0.013	0.031	-0.049	-0.021	0.012	0.009	0.202*
	[0.021]	[0.034]	[0.030]	[0.058]	[0.029]	[0.082]	[0.036]	[0.122]
Financial Caregiver	0.006	0.099***	0.052	0.077	0.000	0.091*	-0.037	0.242***
	[0.023]	[0.037]	[0.036]	[0.069]	[0.025]	[0.053]	[0.043]	[0.077]
Vigorous Exercise								
Basic Needs Caregiver	0.016	0.009	0.030	0.037	0.021	-0.027	-0.030	0.056
	[0.018]	[0.024]	[0.033]	[0.051]	[0.029]	[0.065]	[0.046]	[0.104]
Financial Caregiver	0.005	-0.033	-0.007	0.030	0.024	0.028	0.073*	0.061
	[0.018]	[0.028]	[0.029]	[0.059]	[0.025]	[0.044]	[0.041]	[0.077]
Current Smoker								
Basic Needs Caregiver	0.005	0.005	0.024**	0.014	0.004	0.024	0.019	-0.075
	[0.006]	[0.013]	[0.010]	[0.029]	[0.014]	[0.039]	[0.031]	[0.076]
Financial Caregiver	0.003	-0.016	-0.003	-0.009	0.000	0.019	-0.009	0.033
	[0.008]	[0.013]	[0.013]	[0.020]	[0.008]	[0.023]	[0.011]	[0.052]
Panel B. Intensity of Caregiving								
Fair/Poor Health								
Hours of basic needs assistance provided (logged)	-0.002	-0.002	0.000	0.004	0.000	-0.012	0.012	-0.025
	[0.002]	[0.004]	[0.003]	[0.007]	[0.004]	[0.010]	[0.007]	[0.017]
Amount of financial assistance provided (logged)	0.001	0.004	0.001	0.009*	0.003	0.000	0.005	0.003
	[0.002]	[0.003]	[0.002]	[0.005]	[0.002]	[0.005]	[0.003]	[0.009]
Depression (CESD>4)								
Hours of basic needs assistance provided (logged)	0.005	-0.004	0.007	-0.006	0.001	-0.002	0.006	0.029
	[0.004]	[0.006]	[0.006]	[0.010]	[0.006]	[0.015]	[0.008]	[0.020]
Amount of financial assistance provided (logged)	0.002	0.012**	0.008	0.009	-0.001	0.013*	-0.007	0.034***
	[0.003]	[0.005]	[0.005]	[0.008]	[0.003]	[0.007]	[0.006]	[0.011]
Vigorous Exercise								
Hours of basic needs assistance provided (logged)	0.003	0.000	0.006	0.006	0.004	-0.002	0.000	0.019
	[0.003]	[0.004]	[0.006]	[0.009]	[0.005]	[0.012]	[0.009]	[0.021]
Amount of financial assistance provided (logged)	0.001	-0.005	0.000	0.005	0.003	0.001	0.009*	0.001
	[0.002]	[0.004]	[0.004]	[0.008]	[0.003]	[0.006]	[0.006]	[0.010]
Current Smoker								
Hours of basic needs assistance provided (logged)	0.001	0.002	0.004**	0.003	0.001	0.004	0.005	-0.013
	[0.001]	[0.002]	[0.002]	[0.005]	[0.003]	[0.007]	[0.008]	[0.013]
Amount of financial assistance provided (logged)	0.001	-0.002	0.000	-0.001	0.000	0.001	-0.001	0.000
	[0.001]	[0.002]	[0.002]	[0.003]	[0.001]	[0.003]	[0.001]	[0.007]

Note: Data are from waves 4-10 of the HRS, Robust Standard errors in brackets. All specifications inclues the same covariates listed in Appendix 1; *** p<0.01, ** p<0.05, * p<0.10. Cell coefficients represent the marginal effect of caregiver type (caregiver intensity) on the given health outcome or behavior.

[1] There are a few studies that examine the effect of spousal caregiving on health behaviors (see Burton, et al., 1997)

[2] The remaining four healthy behaviors are hours of drinking, sleep, regularity of meals, health practices, and BMI. BMI and health practices I've included as a health indicators.

[3] Previous runs included a four year model, but due to small sample sizes were not included in the current analysis.